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DECEMBER 3, 1956

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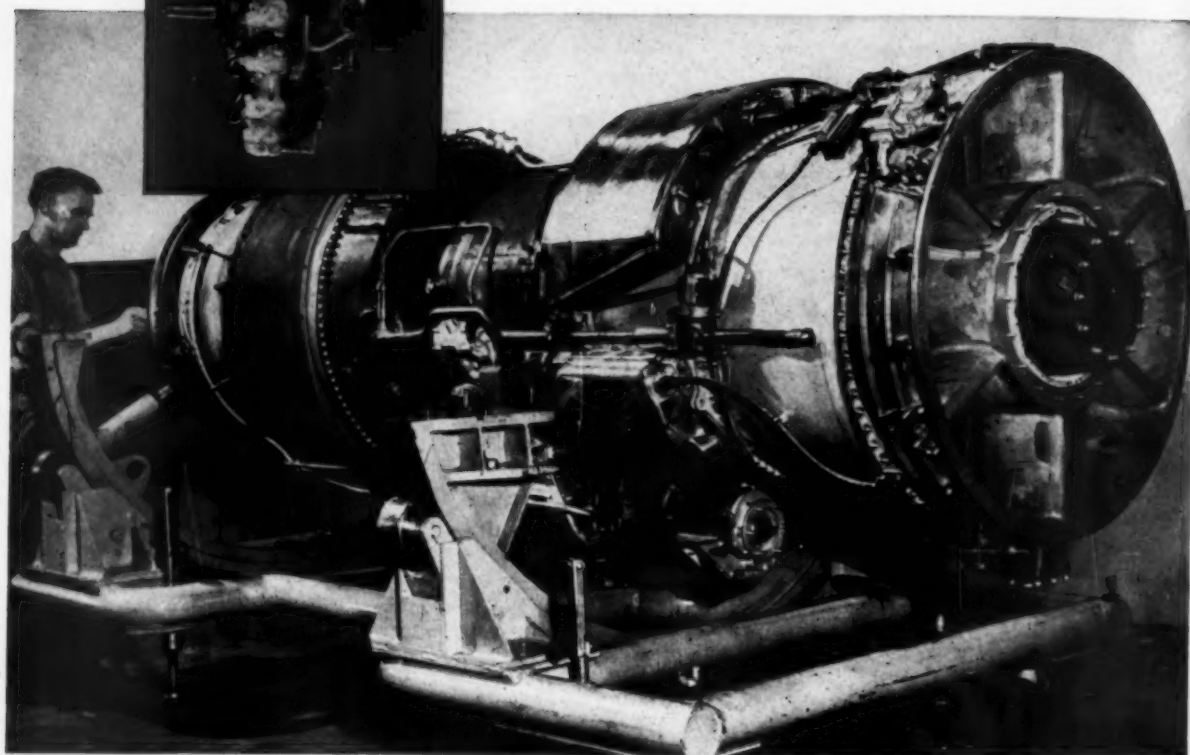
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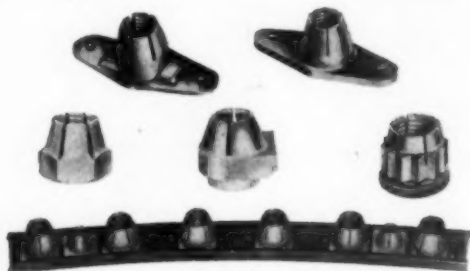
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# Contents

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## INDUSTRY ROUNDUP

Does White House Hold Key to Probe of CAB?	19
New Security Policy: How Far Will It Go?	21
How Army Views Future Flying Needs	23
Latin America's Big Problem: Dollars	24
Record-Breaking CAA Order For Radars Revealed	30
What Pilots Want When Jet Age Comes	39

## ENGINEERING

Lockheed Seeks CAA Approval of 1649A with Hollow Props	33
Small-Diameter Tubing Solves Thermocouple Problem	34
How Ford Broke Testing Bottleneck	36

## ELECTRONICS

How Fly Pointed Way to New Gyroscope	40
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## BUSINESS FLYING

Jet Business Aircraft Should Pay Off	68
Cessna Unveils 1957 Models	71

## TRANSPORT

Here's What American Airlines Plans for Jet Age	74
State Dept. Parley Promises Government Cooperation	77
Airlines Differ Sharply on Hydraulics for Jets	78

## DEPARTMENTS

Personal View	7
When & Where	8
Washington Report	9
Letters	10
Books	10
News Digest	12
Airtrends	17
New Products	46
International Aviation	60
Transport Trends	73
West Coast Talk	74
Airline Commentary	80
En Route	86

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AMERICAN AVIATION

## Two Films: One Down, One Up

**W**E'VE seen a couple of aviation films lately. We offer a dissent on one and a favorable rating to the other.

The dissent is for the opening (Nov. 11) hour-long film "The Day North America is Attacked" in the new "Air Power" series on CBS-TV sponsored by Prudential Insurance Company.

It is a handsome, technically-smooth and very melodramatic production, but we concur with Jack Gould, the incisive TV reviewer for *The New York Times*, who wrote: "The Air Force should get out of show business and stay out. The sight of the top commanders of the Air Force trying their best to be actors and stumbling awkwardly and hesitatingly through their prepared lines was anything but an edifying picture."

Politically there is reason to doubt if such a film serves the purpose for which it was designed. A documentary with trained actors would have been far better without so much histrionics. We are sure that the ensuing film in the series will be far superior and more effective in educating the public to the growth of and need for air power.

Praiseworthy as the opening film was designed to be, the fact is that it resulted in shearing the USAF top command of the dignity and stature which it needs to have.

Both General Nathan Twining, USAF Chief of Staff, and General Earle Partridge, Commander-in-Chief of the Continental Air Defense Command, were strained, ill at ease and self-conscious. Neither of these men should be appearing in such a film.

The airfield shots showing takeoffs of fighters and bombers and the carrier portion were good. Impressive also were the shots of various command centers and the impression of world-wide bases. But we cringed at the shots showing over-calm, time-consuming, tedious and presumably complicated intricacies of making telephone connections.

The commentator was experienced and able. Walter Cronkite, one-time airline man and top United Press reporter now working exclusively for CBS. Cronkite had all the theatrical urgency in his voice but the action on the screen hardly lived up to what was supposed to be a great national emergency.

Television is a wonderful medium but it's having a hard time finding its own level. It succeeds best as entertainment. As a news and public affairs service it is more often a bust than not. A typical example

of a fiasco was election night on CBS. Cronkite was master of ceremonies enforced by a horde of technicians and collaters and regional announcers. But it was a frustrating experience to the viewer interested in important state contests.

We wondered why CBS went to all the trouble of erecting elaborate boards for state contests when the TV camera rarely focused on more than a handful at any time of the evening. Some vital state contests were never shown at all. And half the time some joker of an announcer stood between the camera and the board. It was a floppo of major proportions which proved again that TV is highly superficial as a news medium so far. It is all prologue and overture, nothing in depth. It is excellent for visual presentations but the TV people seem to assume nobody can read, so they chatter worse than on radio.

About the other film, we finally got a glimpse of "Mr. Withers Stops the Clock" in Miami recently. This is the film produced by the Air Transport Association to dramatize the importance of air transportation to the life and economy of the nation.

The New York Port Authority has criticized the film quite severely because, it says, the story allegedly caricatures public officials, or at least one such official. For the life of us we couldn't see any justification for the Port Authority's criticism, much as we tried. In view of the Port Authority's rather unreasoned stubbornness in its attitude toward turbojets, perhaps the real source of the trouble is that the Port Authority saw its own reflection in the mirror.

Hindsight and amateur film producers can always see ways to improve somebody else's films and this one could undoubtedly be improved upon. But we think it has a message rather ingeniously devised and presented, and needs to have a wide showing around the country. Only good can come of it.

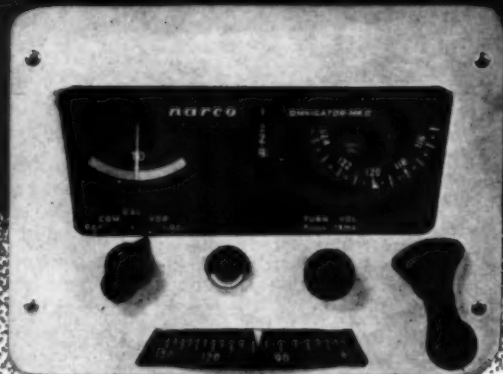
The Mr. Withers film is the first such effort by ATA to present problems faced by all airlines. There should be more of same. For far too long the airlines fought their own individual battles and have let competitive factors distract them from the need for collaboration on common problems. In Miami, for example, the film showing to news and civic people was the first time that all carriers were brought together for a common interest. Such cooperation is long overdue. The Mr. Withers film can accomplish two things. It can get the airlines accustomed to working together on common problems, and educate the public to air transport's vital role.



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## When & Where

### DECEMBER

- Dec. 3—Flight Safety Foundation's 1956 seminar in cooperation with MATS, West Palm Beach, Fla.
- Dec. 4—Air Transport Assn. board of directors, Hotel Statler, Washington, D. C.
- Dec. 5—Air Transport Assn. membership meeting, Hotel Statler, Washington, D. C.
- Dec. 5-7—Instrumentation Conference sponsored by IRE Professional Group on Instrumentation, Atlantic Section, Atlanta Biltmore Hotel, Atlanta, Ga.
- Dec. 6-7—Third annual meeting American Astronautical Society, Inc., Hotel Edison, New York.
- Dec. 7-8—Ninth Annual Arizona Aviation Conference and Flight Clinic, Love Field, Prescott, Ariz.
- Dec. 7-9—18th Annual "Wings Over the Nation" air show, Long Beach Municipal Airport, Calif.
- Dec. 10-12—Eastern Joint Computer Conference sponsored by IRE, AIEE, ACM, Hotel New Yorker, New York City.
- Dec. 17—33rd "Kitty Hawk Day" Anniversary, Kitty Hawk, N. C.
- Dec. 17—Wright Memorial Dinner, Sheraton-Park Hotel, Washington, D. C.

### JANUARY

- Jan. 8-10—Fifteenth Annual Miami-Havana Air Cruise.
- Jan. 14-15—Third National Symposium on Reliability and Quality Control in Electronics, sponsored by IRE, AIEE, RETMA and ASQC, Hotel Statler, Washington, D. C.
- Jan. 23-31—Eight Annual Plant Maintenance Show, Public Auditorium, Cleveland.
- Jan. 28-Feb. 1—Institute of the Aeronautical Sciences 25th annual meeting, Sheraton Astor Hotel, New York City.
- Jan. 31-Feb. 2—Agricultural Aircraft Assn. seventh annual convention, Senator Hotel, Sacramento, Calif.

### FEBRUARY

- Feb. 14-15—Air Force Assn. Annual Jet Age Conference, Sheraton-Park Hotel, Washington, D. C.
- Feb. 26-28—Western Joint Computer Conference, sponsored by IRE, AIEE and ACM, Hotel Statler, Los Angeles.

### MARCH

- Mar. 7-9—National Conference on Aviation Education, sponsored by National Aviation Education Council, Mayflower Hotel, Washington, D. C.
- Mar. 25-27—American Society of Tool Engineers Silver Anniversary annual meeting, Shamrock Hilton Hotel, Houston, Tex.

### APRIL

- Apr. 15-17—National symposium on telemetering sponsored by IRE Professional Group on Telemetry and Remote Control, Philadelphia.

### MAY

- May 6-8—Aero Medical Assn. 28th Annual Meeting, Shirley Savoy Hotel, Denver.
- May 26-June 2—Aviation Writers Assn. annual convention, Chase and Park Plaza Hotels, St. Louis.

AMERICAN AVIATION





## Washington Report

### Behind Scenes in ACTA Squabble

A major behind-the-scenes issue in the split within Aircoach Transport Assn. is a fight between some of ACTA's larger member carriers and the military dating back to February 1955.

At that time, ACTA was put on notice by Brig. Gen. E. C. R. Lasher, then Army assistant chief of transportation, that the military was dissatisfied with performance of individual nonscheduled airlines in military charter service.

Among Lasher's complaints: high frequency of late arrivals and departures; inadequate meals or drinking water; unsanitary and unclean aircraft; unheated aircraft, etc. Further, he stressed over-scheduling and over-commitment together with operational employees, both air and ground, not being aware of their responsibilities.

Air Force, Navy and Marine spokesmen agreed with Lasher's remarks, which also threatened a crack-down on some individual companies.

It is in the face of this military position that the Amos Heacock-led group, which took over control of ACTA October 29, seeks more participation in military business. In some instances, the Heacock group has "demanded" more business.

The military isn't happy, particularly since this new ACTA leadership, through intervention of Sen. John J. Sparkman (D-Ala.), has obtained direct assistance of the Small Business Administration in the fight with the Armed Services. ACTA members who dropped out in protest last month object to the strategy being employed by the organization's new emergency management.

### State Dept. Airs Its Problems

State Dept. finally has taken the first step to bring about closer cooperation between government and industry in formulating bilateral agreements, as demanded by a Senate subcommittee (see p. 77).

No policy decisions were reached during a three-day "exploratory" meeting, but the sessions brought State together with representatives of Civil Aeronautics Board, airlines and aircraft manufacturers. Mainly, the meeting involved a reappraisal of the 1946 Bermuda Agreement on international negotiations.

Prospects: more meetings, with accent on State's problems.

### A 'Deal' on Adams?

Vice Chairman Joseph P. Adams' chances for re-appointment to Civil Aeronautics Board now are considered about 50-50, despite an otherwise firm Administration policy against renaming Truman appointees to federal posts. And if the Adams renewal fight is success-

ful, it may well be traced to a reported "deal" made last May.

It is unlikely parties involved ever will admit it, but top Democratic senators offered in early May to grant quick approval to a then-pending nomination of G. Joseph Minetti if assurances could be given of Republican support at the end of the year for Adams. Minetti's appointment, which had been pending five months, then was approved by the Senate within two weeks.

Further, despite long-promised fireworks on the Minetti appointment, the Senate hearings actually were brief and extremely polite.

Now Adams is showing surprising strength from, of all places, top Republican offices.

### Wilson Revises Progress Payments

Defense Secretary Wilson's new directive ordering greater contract financing assistance for small companies seeking military contracts may benefit large companies—particularly aircraft manufacturers—even more than small business.

Directive provides a more generous rate of liquidation in progress payment contracts. This means companies supplying the government under such contracts can expect to recover their own investment and begin to accrue profits faster than was permitted previously.

In case of contractors getting progress payments at the rate of 75% of their total costs, the new directive permits liquidation at a rate of 70% of the billing price. The earlier liquidation rate was 75%. Thus, in the case of an item costing \$100 and priced at \$108, contractor can now expect a deduction of \$75.60 upon delivery of the first item to offset prior progress payments, leaving him a net of \$32.40. Under the earlier 75% liquidation rate, his deduction would be \$81 and his net only \$27.

Although the new arrangement looks good on paper, getting it into operation is another matter entirely. Some Pentagon procurement experts are gloomy over prospects for rapid implementation of the directive because it introduces complex new factors in the progress payment type contract. They fear these will pose new headaches for procurement officers and cause new lags in negotiation and execution of progress payment contracts.

### Getting the Most Out of ATC

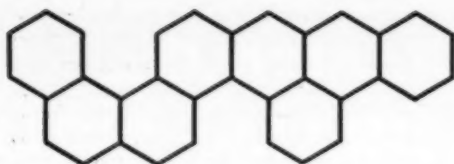
Civil Aeronautics Administration's three-year facilities program to ease overcrowded air traffic control system will be a real help, says Presidential Aide Edward P. Curtis, provided it continues to be supported financially by Congress and is pushed with vigor and enthusiasm.

Toward this end, Curtis indicates his office is giving CAA all the support in its power to push the program.

As Curtis sizes up today's traffic control situation, the best we can hope to do in the near future is to bolster the present system, get the most we can out of it. And once the blueprint for a future system has been worked out, his "extraordinarily difficult problem" will be selection of a government organization to carry it out.

Optimistically, Curtis hints that certainly we can devise some more simple, authoritative type of organization than the complicated and cumbersome system of committees now attempting to compromise and coordinate the legitimate differences of various airspace users.

This point is well taken. Example: It took the Air Coordinating Committee's Special Working Group 13 approximately 34 months to complete a planned 60-90-day review of the common navigation system.



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## Letters

### Those Fords in Moscow

To the Editor:

I have greatly enjoyed your En Route articles in *AMERICAN AVIATION* for some time. Your suggestion of providing the embassies in the Communist countries with late model cars struck my fancy as being particularly worthwhile.

I was, therefore, very pleased to see the Ford Motor Company rise to the bait apparently in very fine fashion.

LEONARD D. BURDETT  
Quality Control Manager  
The Torrington Company

Torrington, Conn.

To the Editor:

Just read "Heartfelt Thanks to Ford" in the October 22 issue of *AMERICAN AVIATION*. I have always considered you one of the greatest, and this is just one more great achievement. You should have a medal for this one.

It is patriotic, constructive and informative, because it speaks louder than words and counteracts some of the Red lies that are being told about us in Communist countries. Furthermore, it dresses up our representatives in foreign countries. What better advertisement could we have of our way of life and the manufacturers their wares than to have the U.S. Embassy showing their products? Everywhere our cars go they carry prestige for the U.S.

Congratulations to you and all the Ford boys, because I know them all personally. The reverberations from this move will be multiplied far beyond any thoughts or imagination at present.

There are two great moments in every deed—one is knowing you have done a job, and the other is for the other fellows to recognize you for it. Again, my congratulations.

ROSCOE TURNER, Chairman  
Aeronautics Committee  
National Security Commission  
The American Legion  
Indianapolis, Ind.

## Books

### Properties of Combustion Gases.

Prepared by Aircraft Gas Turbine Development Dept., General Electric Co. Published by McGraw-Hill Book Co., Inc Two volumes. \$75.

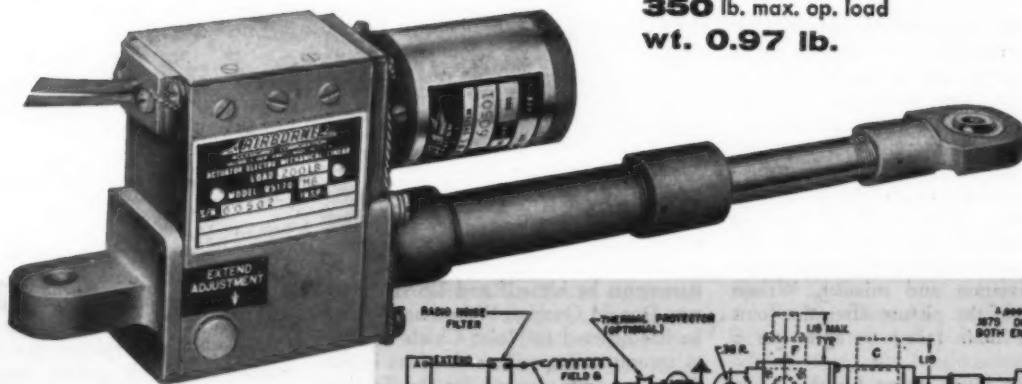
A set of comprehensive combustion gas thermodynamic tables, compiled for the first time, with the aid of an International Business Machines Co. electronic computer, that is expected to prove of considerable value to those engaged in combustion research, in development of gas turbines and turbo-jet engines and in aircraft and missile propulsion studies. Volume I, titled *Thermodynamic Properties*, includes tables with a gas of .25 fuel/air equivalence ratio, with a pressure of .01 atmospheres. Volume II, titled *Chemical Composition of Equilibrium Mixtures*, presents, the chemical composition data from which all the gross mixture properties in Volume I were derived.

8-A-99

# LINEAR ACTUATOR

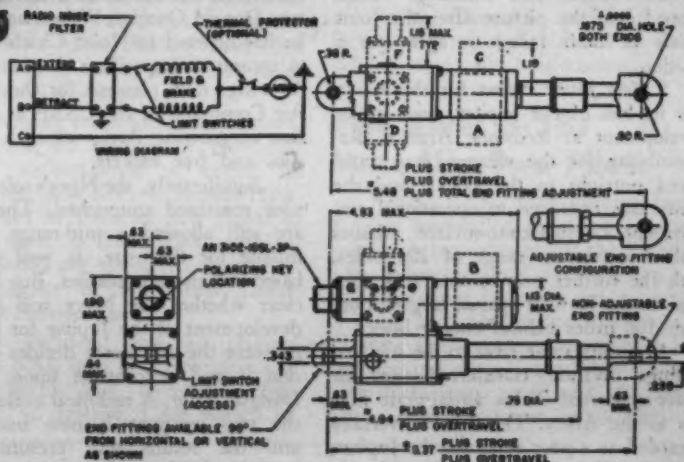
**R-5170**

**350 lb. max. op. load  
wt. 0.97 lb.**



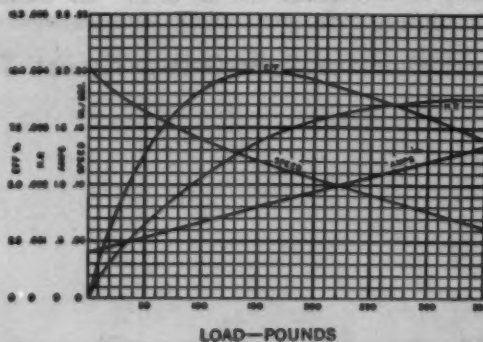
## GENERAL ENGINEERING DATA:

- 1 26 volt dc split field, series wound reversible, intermittent duty motor with magnetic brake. Available with thermal overload protector.
- 2 Unit includes limit switches externally adjustable through entire length of stroke, positive overtravel stops, overload clutch, and anti-rotation device.
- 3 Maximum operating load—350 lb. Ultimate static load—1000 lb. for 12 inches maximum extended length.
- 4 Weight 0.97 lb. Plus 0.03 lb. x stroke in inches. Plus 0.04 lb. for thermal overload protector.
- 5 Maximum dimensional tolerance  $\pm .03$  in. unless otherwise specified.
- 6 Dimensions given are minimum lengths for zero stroke. To determine minimum length for required stroke, add stroke plus stroke overtravel plus total end fitting adjustment.



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# Industry News Digest

## Army Loses Jupiter, Hope for Bigger Aviation Role Under Wilson Order

Defense Secretary Charles Wilson last week smashed Army plans for use of the 1500-mile Jupiter ballistic missile and ordered new restrictions on the Soldiers' ambitious aviation program.

The actions were ordered in a new "Clarification of Roles and Missions" of the military services. It was aimed at settling a number of troublesome disputes between the Air Force and Army regarding the latter's responsibilities in aviation and missiles. Wilson stepped into the picture after the Joint Chiefs of Staff failed to agree on a solution.

• Most bitter defeat for the Army was its loss of the Jupiter, now under development at Redstone Arsenal. Responsibility for the weapon was transferred outright to the USAF and the Army was restricted to operational employment of surface-to-surface missiles with a maximum range of 200 miles, with the further proviso that such missiles cannot be used against targets more than 100 miles behind enemy lines.

In an apparent salve to the soldiers' feelings, Wilson transferred the Air Force-supported Talos anti-aircraft missile to the Army. This was universally regarded as a poor swap for the Jupiter, however, since the Army has already examined and rejected the Talos. But the soldiers did win at least one distinct advantage. Wilson gave them responsibility for development and use of all point defense surface-to-air missile sys-

tems capable of knocking down enemy aircraft "out to a horizontal range of 100 nautical miles." This is double the range previously allowed Army anti-aircraft missiles.

• Along with the severe blow dealt Army aspirations for long-range missiles came a backhanded compliment for the success of its work with shorter-range weapons like the Honest John, Corporal and Redstone. Confirming previous statements by himself and USAF Secretary Donald Quarles, Wilson announced he has ordered the Joint Chiefs of Staff to recommend specific reductions in the 39 wings now planned for the Tactical Air Command of the USAF in recognition of growing Army strength in missiles and free rockets.

Significantly, the Navy's role in missiles remained untouched. The sailors are still allowed a mid-range ballistic missile for fleet use, as well as ship-based anti-aircraft missiles. But it is not clear whether the Navy will continue development of the Jupiter for fleet use in event the Air Force decides to abandon it and concentrate upon its own Douglas Thor. A technical evaluation of the two weapons is now under way and the results will presumably be available in the spring.

• Less disastrous for the Army was the treatment accorded its aviation program by the latest clarification. While the document retains the 5000-pound limitation on the empty weight of Army

fixed-wing aircraft and sets a new ceiling of 20,000 pounds on the empty weight of its helicopters, it contains the following important clause: "Specific exceptions to weight limitations for specific aircraft for specific purposes may be granted by the Secretary of Defense after consideration of Army requirements and appropriate Air Force functions and capabilities."

The clarification thus creates the first machinery for exceeding the size limitations set on Army aircraft. Of course, Wilson's attitude on granting exceptions cannot be predicted, but the document notes that the Defense chief "has just approved the purchase by the Army of five DeHavilland DHC-4 (Twin Otter) airplanes for test and evaluation and is giving consideration to another project involving a plane in the development stage." (The latter aircraft is probably the 275 to 300-knot observation machine jointly financed by the Army and Marine Corps and now in the midst of a design competition.

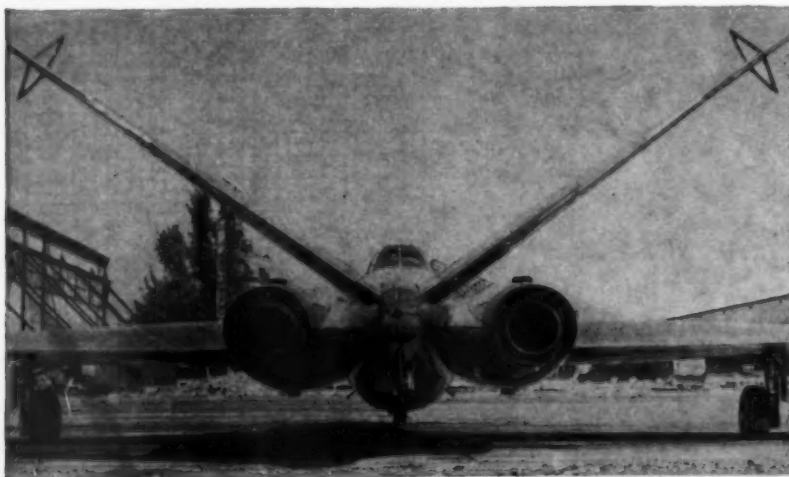
• Although Army aviation men emphasize that their current R&D program is not affected by the document, it seems obvious that exceptions from weight limitations will be required for at least two important categories of aircraft. One is the category of STOL/VTOL transports, now under construction in test bed form. With results of this program coming in next summer, the Army may be ready to order prototype models by this time next year.

The other category is that of flying cranes. Parametric design studies of cranes capable of lifting 16,000 to 30,000-pounds are now under way, and the Army may order a design competition in the spring. If all goes well, it could be ready to order flying prototypes by the end of 1957.

The procedure for obtaining exceptions from the weight limitations appears to raise at least one important obstacle in the Army's dealings with airframe manufacturers. As it now stands, it seems to require one exception to build prototype aircraft in excess of the weight ceilings and a second exception to order the same aircraft in production quantities for operational use should it prove acceptable.

• This necessarily injects an element of uncertainty in contractors' dealings with the Army since few companies would be willing to pour money and engineering time into a prototype development project unless they had assurance that the Army could go ahead and buy their products in quantity should they prove satisfactory.

## Test Bed for 2,500-lbs.-Thrust Turbojet



French Fouga Makalu, basically a modified Magister, is being used as a flying test bed for the 2,500-lbs.-thrust Turbomeca Gabizo turbojet. This unusual view shows tailpipes and standard Magister V-tail.



## Orders for Warning Units Near 1,000

Firm orders by airlines and executive aircraft operators for Collins Radio Co.'s PI-101 aircraft proximity warning indicators now exceed 900 units valued at approximately \$10 million, the company reports.

Collins officials indicate that system development is progressing on schedule and is being coordinated with Aeronautical Radio, Inc.

## Bakke, Chamberlain Switch CAB Posts

Oskar Bakke, former deputy director of CAB's Bureau of Safety Regulation, became head of the activity recently in an exchange of posts with former director John M. Chamberlain.

The shift, made at Chamberlain's request for reasons of health, was "regretfully" approved by the Board last week. It ends an eight-year term as head of BSI for Chamberlain, who now becomes deputy director.

## Beech Aircraft Forms Financing Subsidiary

Beech Aircraft Co. has formed Beech Acceptance Corp., a wholly owned subsidiary, to handle financing of business aircraft purchases on de-

ferred time-payment plans offered by its distributor and dealer organization.

Overall activity of the new organization will be to assist in financing of Beech's "floor plan" for distributors and dealers; its retail financing plan for buyers, and a leasing plan for business aircraft operators.

O. A. Beech, president of Beech Aircraft, will serve as board chairman. Other officers, all connected with the parent firm, are: Frank Hedrick, president; A. R. Bell, v. p. and operating manager; and John Elliott, secretary-treasurer.

## CAB Reaffirms Awards In N.Y.-Florida Case

Civil Aeronautics Board reaffirmed all major route awards in its controversial New York-Florida case, but changed two grants to Delta Air Lines and National Airlines.

In denying reconsideration petitions, CAB made no change in Northeast Airlines' authorization to extend its routes from New York to Miami. However, award to Delta of new rights to Tampa, made in the original decision, was rescinded and decision deferred until completion of the Great Lakes-Southeast Service Case.

Also rescinded was an original award to NAL involving new service to Winston-Salem and Greensboro-High Point, N. C. Instead, CAB started an

investigation to determine whether NAL or Capital Airlines can best serve the needs of those communities.

## Piasecki Acquires Bellanca Assets

Piasecki Aircraft Corp. has acquired the physical assets of Bellanca Corp.'s aircraft division for \$1,325,000, in a move that will increase its manufacturing space about ten-fold.

The facilities, located at New Castle, Del., will be operated as the Delaware division under the direction of James Manning. Included is 258,000 sq. ft. of manufacturing space equipped with machinery, and a private airport with a 3,500-ft. runway on a 330-acre site.

Frank Piasecki, president, said further expansion is planned at Philadelphia corporate headquarters.

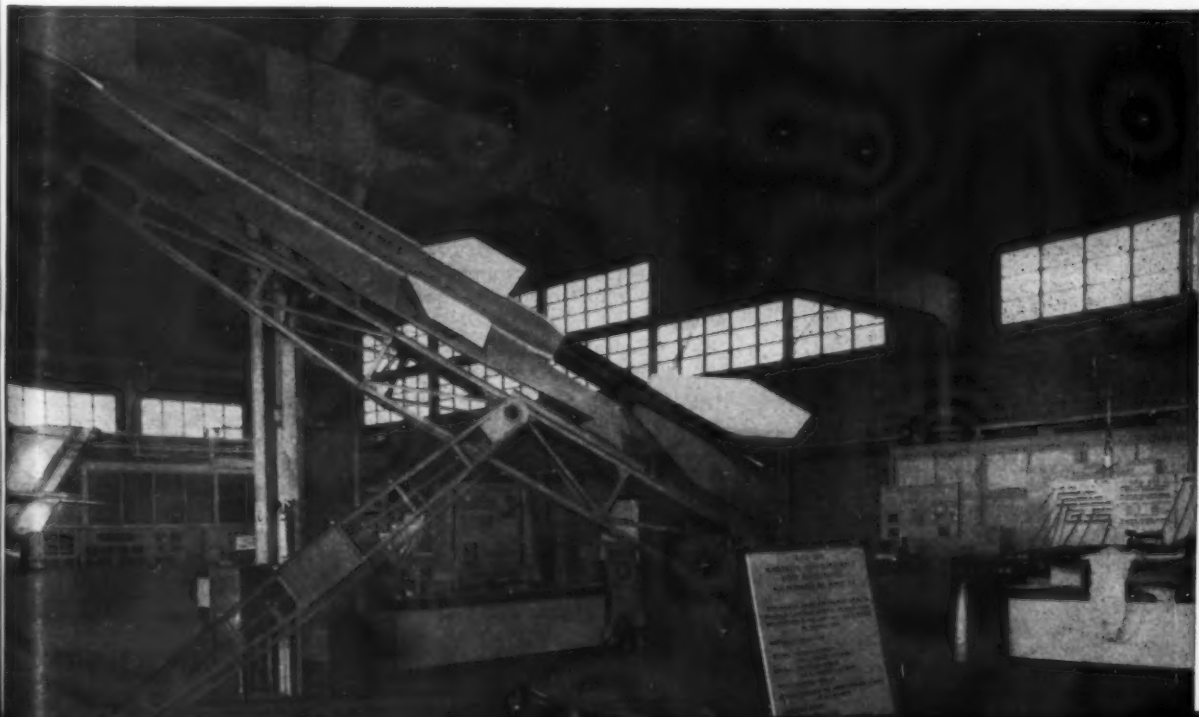
## Pyle Rules S-58s Must Use Two Pilots

Acting CAA Administrator James T. Pyle has settled the one-versus-two-man crew requirement for the Sikorsky S-58 helicopter with a ruling that all S-58 operations in scheduled passenger or cargo service must use two pilots.

The CAA action came after a formal demand several months ago by Air Line Pilots Assn. president C. N. Sayen that a two-man crew be ordered by

## New French Supersonic Test Vehicle

This two-stage Mach 2.5 research rocket was one of the recent French developments shown last month during an ONERA exhibit at Reims. It carries recording and telemetering equipment for high-altitude research, is recovered by parachute. It will be test-fired this month. Earlier recovered model is shown at right.





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## Production Spotlight

• Air Force's losses in B-52s now number two and one-half aircraft. In addition to the two involved in flight fires, a third Stratofortress recently landed afire and the entire hydraulic power package blew out of the fuselage side on touchdown. As result, USAF reportedly is studying conversion to fire-resistant hydraulic fluid on the eight-jet bomber.

• Sikorsky S-62 is the designation of a turboprop-powered version of company's S-56 40-place transport helicopter. Piston version uses two Pratt & Whitney R2800s, the S-62 two Allison T56s.

• Vickers-Armstrongs has delivered its 150th Viscount. The aircraft will be used as personal transport for the president of Brazil. It was accepted last month by Brazilian Air Force. Viscount No. 50 was delivered March 1955, No. 100 last March.

• Shin Mitsubishi Heavy Industries is planning domestic production of Sikorsky S-55 and S-58 helicopters for Japan's self defense forces.

• Hydraulic control package for Martin Lacrosse missile will be produced by Pesco Products Div., Borg-Warner Corp. System for Nike B reportedly will be built by Vickers, Inc.

• Finland is planning to build the Folland Gnat light fighter under license. Finnish Air Force already has ordered a quantity of Gnats (reportedly more than 12) from British manufacturer.

• Bendix Scintilla has received a \$120,000 order from American Airlines for 125 airborne ignition analyzers to be installed in AA's DC-6/7 fleet. Another Bendix division, Bendix Radio, has received orders from Northeast Airlines for Model RDR-1 airborne weather radar systems NEA will fit into its DC-6Bs on its newly won Boston-New York-Miami operation.

• Bell XH-40 and Kaman HOK-1 helicopters are not the only potential applications for Lycoming T53 free turbine. Engine is being ordered in small quantities for a number of STOL designs, such as testbed developments by Doak Aircraft, Ryan and others.

• Third prototype Bristol Type 173 twin-rotor helicopter with a pair of 850-hp Alvis Leonides Major engines has flown. Two others are nearing completion. The five are part of a Ministry of Supply-sponsored program for the RAF-Type 192—with either piston or turbine engines—and a turbine-powered 20 seater capable of 140 mph and 100-mi. stages for civil use.

• First test firing of Douglas Aircraft's Thor IRBM missile is scheduled this month at Patrick AFB, Fla. Range of Thor is 1,500-mi.

• First prototype Saunders-Roe SR53 mixed-powerplant fighter is nearing initial flight. It will use an Armstrong-Siddeley Viper jet and a De Havilland Spectre rocket. Subsequently a Bristol Orpheus may replace Viper. Other prototypes may use DH Gryon Junior.

• BuAer evaluation team has approved North American T2J jet trainer mockup with minor changes.

• Bristol Orpheus 2 jet has completed an official type test of 150 hrs. at 4,520 lbs. thrust. In order to simulate—and obtain clearance for—altitude combat rating turbine temperatures, the 2 was run at Orpheus 3 rpm/temperatures, resulting in more than 5,000 lbs. takeoff thrust.

• Convair-San Diego has amassed 21,814,875 manhours without a disabling accident, claimed a world record for the industry. Total of 35,000 employees racked up record in 105 days.

• Ireland's Aer Lingus currently is equipping its DC-3s with VOR receivers, hopes to be first European airline to have its entire fleet so fitted. Its Viscounts already have VOR. Transmitters for VOR are operating in France, Germany, Ireland and the Netherlands. First U.K. transmitters will go into operation this winter.

• Armstrong Whitworth no longer specifically ties its twin-engine AW 650 boxcar freighter to the Rolls-Royce Tyne. Prospective purchasers may have a choice of the Bristol Proteus or Orion, Napier Eland or a U.S. turboprop.

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## Industry News Digest

CAA. Initially, the S-58 was certificated and planned for operation by New York Airways with a single pilot.

The two-man rule will be applied to all operators as S-58s are introduced into service. Its effectivity in New York Airways operation will be on an agreed upon schedule, once CAA reviews with the carrier the training and employment problems it creates.

### NEA Plans to Raise \$7 Million in Capital

A new stock issue to raise \$7 million net in connection with an expansion program, including purchase of additional flight and ground equipment, is planned by Northeast Airlines. Offering will be made about the middle of December by an underwriting group headed by Carl M. Loeb, Rhoades & Co.

NEA also revealed last week that it was negotiating for a "prompt short-term lease" of six Lockheed Constellations for use this winter over its new New York-Florida route. Such negotiations were said to be under way with TWA. The company has 10 DC-6Bs on order for delivery between January and September, 1957, and is negotiating for purchase of five Bristol Britannia turboprops.

### Douglas to Offer Convertible Debentures

Douglas Aircraft Co. soon after January 1 will issue a public offering of convertible subordinated debentures to raise about \$25 million. Company will apply the proceeds to working capital for general use, including its DC-8 jet transport costs and facilities expansion.

### Obituaries

• Maj. Lester Durand Gardner, 80, one of the organizers of the Institute of the Aeronautical Sciences, died in New York Nov. 22.

As president of Gardner Publishing Co. in 1915, Maj. Gardner was publisher of *Aviation* magazine. During World War I he served with the Army Air Service. In 1928, he was president of the Aeronautical Chamber of Commerce of America, and four years later was an organizer of the Institute. Later he was elected executive vice president and council chairman and directed the Institute's activities until his retirement in 1946. He also served as president of the Aeronautical Archives, museum attached to the Institute.

• Edward G. Bern, 59, vice president-sales and traffic of Pan American-Grace Airways, died at his Searingtown, L.I., home Nov. 23.

Bern had been in the airline business since the early '20s, when he headed K. C. Airways. From 1934 to 1936

he was president of Columbia Airlines. During the next seven years he was with American Airlines as publicity director and later as a vice president. During World War II he served as general manager of Hughes Aircraft, and later joined Peruvian International Airways as vice president-sales. He joined Panagra in 1949 as sales manager and was elected vice president in 1952.

• Vice Adm. Ralph A. Ofstie, USN, 59, died at Bethesda Naval Hospital on Nov. 18. A pioneer naval aviator, he set several seaplane speed records and participated in the Schneider Cup races. He was formerly commander of the Sixth Fleet in the Mediterranean and at one time served as Deputy Chief of Naval Operations for Air.

## News Briefs

### MANUFACTURING-MILITARY

• First Boeing KC-135 jet tanker will be delivered late next spring to the 93rd Bomb Wing of Strategic Air Command at Castle AFB, Calif.

• First Lockheed C-130 turboprop Hercules transport will be delivered to an operational unit early this month. The 463rd Troop Carrier Wing, Ardmore AFB, Okla., will receive the plane.

• USAF awarded a \$2,198,271 contract to Craig Systems Inc., for air traffic control and communications equipment, composed of a series of integrated mobile electronic units to be housed in air transportable vans.

• Lockheed Aircraft Corp. received a new \$25-million contract from the Navy for P2V-7 Neptunes. It includes plans for the Japanese Maritime Self Defense Force and the French Navy. This marks the Navy's 25th order since Lockheed began building Neptunes in 1944, and extends production of the submarine hunter-killer through 1958. Plane is powered by two Westinghouse J34 jets in underwing pods and two Curtiss-Wright Turbo Compound piston engines.

• Weber Aircraft Corp., Burbank, Calif., received an additional USAF order for more than \$1 million for upward ejection seats for the Boeing B-52.

• Federal Telephone & Radio Co., division of International Telephone and Telegraph Corp., was awarded an \$18,903,150 follow-on contract by Navy Bureau of Aeronautics for airborne Taccan equipment.

• Solar Aircraft Co. reported \$199,767 loss on \$34,157,759 sales in the six months ended Oct. 31. Although sales were up from \$25,431,899 in the same 1955 period, the increase was not enough to overcome \$189,200 loss in this year's first quarter. Losses were attributed to a month-long strike, engineering changes, and higher than anticipated starting costs on certain items entering the manufacturing stage.

• Menasco Mfg. Co. had net earnings of \$153,687 on \$5,447,638 sales in the first quarter of its 1957 fiscal year, against \$162,566 earnings on \$4,035,807 sales in same period last year. Drop in profit was blamed on costs encountered in getting a new Texas plant in operation.

### TRANSPORT

• A strike against Eastern Air Lines was averted when the company and the International Association of Machinists reached agreement just 45 minutes before the Nov. 22 scheduled walkout. Settlement is said to include a wage boost "substantially concurrent" with that granted to United Air Lines mechanics in August. UAL workers won a pay hike ranging from 13¢ to 26¢ an hour.

• Robert L. Kunzig has been re-appointed assistant to CAB Chairman James R. Durfee. Kunzig resigned the position last September to serve with the Republican National Committee's "truth squad." He replaces Herbert K. Hyde, resigned.

• National Airlines on Dec. 14 will open a flight operations base in New York, presumably at N.Y. International Airport, to cover Idlewild-Newark operations. New base will be headed by J. E. Trevathan as chief pilot-New York and will involve permanent assignment of six to eight planes and 40 to 50 pilots.

• Braniff Airways has taken delivery of the first of five Convair 440s ordered as part of its \$83-million new equipment program.

• KLM Royal Dutch Airlines has named eight senior vice presidents, a new title in the company. They are J. A. Bach, operations; V. H. L. Dubourcq, field organization; T. M. van Erp, planning; A. H. van Gelder, finance; J. C. van der Klott, marketing, and J. Luymes, engineering and maintenance.

• John H. Connelly, president of Southwest Airways, is on an inspection trip of three European aircraft plants to look at possible replacements for SWA's DC-3s and Martins. He is inspecting the Fokker F-27, Vickers Viscount and Napier Eland turboprop Convair.

• American Airlines flew over 449 million passenger-miles in October, a 12% gain over the same 1955 month. Nearly three-quarters of a million passengers were carried, up 8%. Largest gain was in freight ton-miles, which totaled a record 7,834,000, up 17.6%.

• Edward D. Nicholson, assistant to the president of United Air Lines and regional affairs manager in Denver, retired after 13 years with the company.



# AIRTRENDS

Washington, D. C., Dec. 3, 1956

**HARD-DRIVING DECISION** by Defense Secretary Wilson on roles and missions of the military services (see page 12) lays to rest—at least temporarily—important USAF-Army disputes. In achieving this end, Wilson has resorted to the often-criticized method of arbitrary weight and mileage limitations on weapons performance. Result is a ramshackle structure of responsibilities that is just as surely destined for rapid obsolescence as the set of restrictions it replaces.

**NAVY'S STAND AGAINST** contracting major engine overhaul to commercial operators has been broken. Southwest Airmotive received a \$750,000 contract to overhaul J33s—the first contract for overhaul of any type aircraft engine to be assigned by the Navy to a non-manufacturing facility since the end of World War II. This raises hopes that Navy might relent in its opposition to civil operation of flight training schools and other facilities.

*Other good news* for civil operators is Army Transportation Corps' estimate that about 90% of maintenance and overhaul of its aircraft will be done by private industry within the next few years.

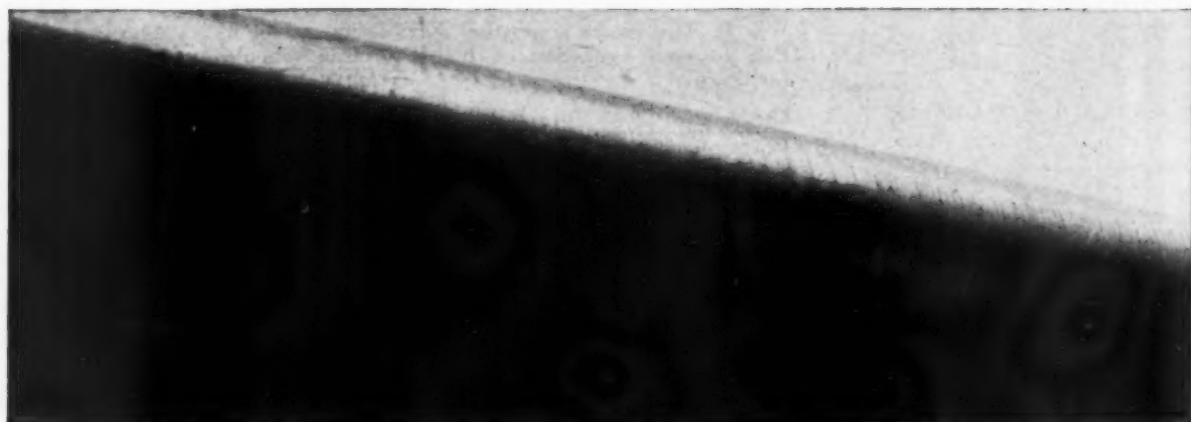
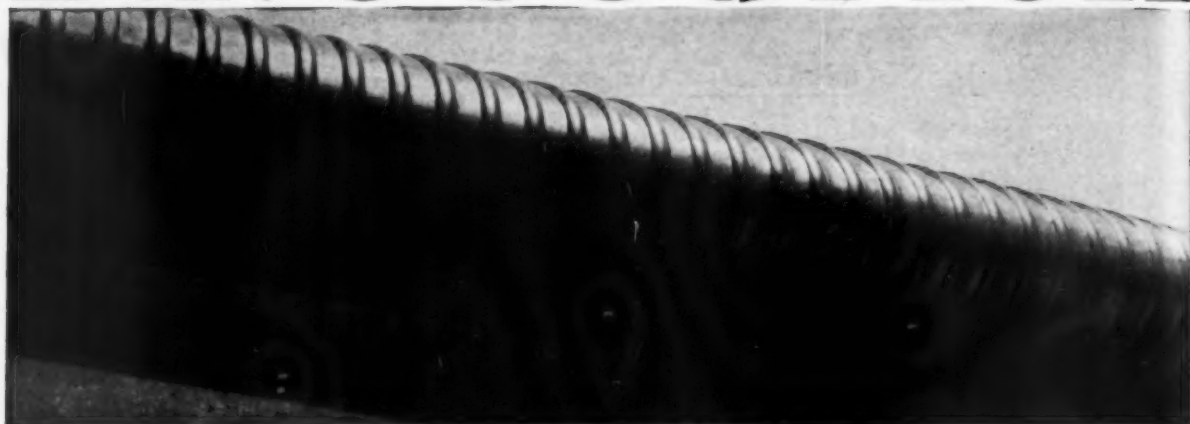
**THE COOLIDGE REPORT** has effectively plugged most military information sources (see page 21). What's more, it looks like they'll stay plugged. Past attempts to restrict news flow were generally forgotten in a month or so. But the latest effort threatens such dire sanctions against military and company officials for security lapses that it is not likely to be forgotten soon. Furthermore, the services have been told to "implement" the Coolidge recommendations with regulations of their own.

**DELIVERIES OF GUIDED MISSILES** to the Air Force will more than triple during the next two or three years. USAF is scheduled to spend \$800 million, or 11% of its total money for hardware purchases, on missiles in the current fiscal year. It's expected that this will climb to about \$2.5 billion by fiscal 1960.

*But this figure* by no means represents the extent of the contribution required from industry. USAF warns that manufacturers must be prepared to provide greater maintenance support at the depot level. They may also be called on for operations and field maintenance of the complex and troublesome weapons.

**THE TENDENCY** of hot bodies to radiate away a large amount of their heat offers a promising avenue of research for designers struggling with the problem of aerodynamic heating at hypersonic velocities. A North American Aviation engineer recently gave this example of "equilibrium temperature" in action: "An aircraft flying at Mach 8, or 5,000 miles an hour, would be subjected to 6,000 degrees were it not radiating enough of its own heat to reduce its skin temperature to 800 degrees."

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## Does White House Hold Key to Probe of CAB?

Attacks on Harmar Denny, Republican Board Member, linked with New York-Florida case; new Senate hearings scheduled to start next month.

By WILLIAM V. HENZEY

**T**HE TRAIL embarked upon by investigators when Civil Aeronautics Board's New York-Florida Case erupted into a scandal last August is turning out to be a super highway.

To get the answer to what went on in the Florida Case, investigators are finding fruitful hunting in the background and details of two other prominent 1956 Congressional investigations and are casting quizzical, if not yet suspicious, eyes at the White House.

Ironically, the man in the White House perhaps most insistent on "cleaning up" CAB—Presidential Assistant Sherman Adams—may have some public explaining to do on his own. Particularly interesting to investigators is how much Adams knowingly or otherwise may have inspired or lent encouragement to the constant attacks on CAB Republican Member Harmar D. Denny.

• **The answer is important** to investigators because the move to "get" Denny now appears to have a direct bearing on the New York-Florida Case mess. And to understand fully the breadth of the move against the 70-year-old Pittsburgh Republican, investigators are looking into the background of the Celler (House Antitrust) Subcommittee hearings last spring and, to some extent, into details of the Senate Investigating Subcommittee's investigation of Los Angeles attorney Murray Chotiner.

The series of anti-Denny actions in the past 18 months produces some interesting connections. In the summer of 1955, for example, Trans American Airlines (then North American) filed a motion to disqualify Denny from a case in which they were involved. Supporting the motion was a sworn affidavit of Trans American's Washington representative Laurance G. Henderson, containing numerous allegations against Denny. The motion failed.

• **Last March**, the Celler Hearings were launched with an attack on Denny and his part in CAB's 1953 dismissal of a then-pending general passenger fare investigation. Part and parcel of the



Denny: A White House target?



Adams: Explanations in order.

Celler attack on Denny and the scheduled airline industry in general was a Trans American charge of a "conspiracy" against it.

In numerous press releases during and subsequent to those hearings, Trans American drew repeated attention to the charges against Denny. Denny's denial of the charges never seemed to catch up with the accusations.

### Adams' Role Unclear

How does Sherman Adams fit into this picture? Perhaps he doesn't. But a review of his advice to intimates in the spring of 1956 will reveal agreement with Trans American's anti-Denny views plus encouragement that a Denny ouster was under study. One Trans American avenue to Mr. Adams was in the person of Raimond Bowles, New Hampshire public relations man and former Republican patronage official in Washington. At various periods starting in July, 1955, Bowles was retained by Trans American.

Whether he knew it or not, Adams played into the hands of Manny Celler with his views on Denny and, ironically, Celler hardly was out to help the Eisen-

hower Administration.

Still Denny, whose term is not slated to expire until Dec. 31, 1959, stayed on at CAB.

Recently, Trans American repeated its motion for disqualification of Denny in another case involving it. Attached to the motion was the same Henderson affidavit of a year ago. The motion is still pending at CAB.

Since there are other CAB Members who have voted against Trans American, it may be puzzling at first glance to understand the concentrated effort against Denny. But if, for example, a top White House official condoned, knowingly or otherwise, the efforts against Denny, then those pressing the attack would be encouraged to continue to make the Pittsburgh Republican so controversial the ultra-conservative Eisenhower team would be forced to drop him.

In short, Denny, the first Republican ever appointed to CAB by a Republican Administration, has elements of his own party to thank for encouraging a get-rid-of-Denny movement.

What has all this to do with New York-Florida Case? Basically, that is

one of the major items which the Senate Permanent Investigating Subcommittee intends to develop in public hearings scheduled to start in early January. Suffice it for the moment to note that Denny cast one of two Republican votes against Northeast Airlines which, on August 2, won a 3-2 CAB vote for a route extension from New York-Florida.

Since CAB's August 2 vote was "private," the fact that NEA stock went wild on August 3 led to seemingly sound suspicions of a "leak" and numerous investigations of which the Senate Subcommittee's is the most prominent and most thorough.

• When it looked at the outset that some CAB Member might be in trouble over the "leak," Denny oddly enough was the first one to be mentioned in rumors leaked mysteriously to a syndicated columnist. Suspicion also was thrown in those rumors on CAB Member Chan Gurney who, with Denny, cast an anti-Northeast vote on August 2, and on Delta Air Lines' Washington official Robert L. Griffith, who happened to be CAB's Compliance Chief when that division spearheaded a revocation case against Trans American in the 1953-55 era.

Since then, it has been discovered by investigators that Trans American, only a Court order away from being forced out of the non-scheduled airline business and itself an applicant for the route won by Northeast, has had more than a passing interest in Northeast and its power-laden bid for a lush New

### Dr. Warner To Get Wright Bros. Trophy

Dr. Edward P. Warner, president of the Council of the International Civil Aviation Organization, has been chosen to receive the 1956 Wright Brothers Memorial Trophy.

The award to Dr. Warner is "particularly appropriate" as he leaves the ICAO post in which he has served with brilliant success for more than 10 years, said Thomas G. Lanphier, Jr., president of National Aeronautic Assn.

York-Miami run.

For example, it now develops that Henderson, then retained by Trans American; Bowles, the New Hampshire public relations man, and a Washington attorney Gillis Long, sought to interest numerous prominent New England financial people in purchasing Floyd B. Odlum's controlling interest in Northeast.

Among the New Englanders contacted were Bayard Ewing of the Providence, R. I., law firm of Cross, Graham, Reid & Ewing; Forrester A. Clark of the Boston brokerage firm of H. C. Wainwright and Co.; Frederick Dearborn of the Boston firm of Bingham, Dana and Gould, and others. Bowles arranged the meetings, Henderson presented the plan, and Long was the counsel.

• Throughout the presentation of

the plan, which envisaged a New England "front" for the interests friendly to Trans American, both Bowles and Henderson played down their relationship to Trans American.

The Bowles-Henderson-Long program, as such, lost steam in the uproar which followed CAB's August 2 vote for NEA. In its place came direct overtures from Trans American to the New England financiers. Handling the matter at this stage were Henderson and J. B. Lewin, one of the four principals in the Trans American organization.

Senate investigators have a lot of questions to ask concerning those maneuvers. They are also interested in the fact that Forrester Clark, one of the New England men contacted, Hardy K. Maclay, Trans American's lawyer, and Maurice Rosenblatt, also linked with Trans American, were among August 3 purchasers of NEA stock.

Meanwhile, the Senate group this month is expected to renew hearings into activities of Chotiner, the Los Angeles attorney who was retained a year or two ago by Trans American. Senate interest was aroused when bare details showed up in a previous hearing of Chotiner visits to the White House and possible inquiries from the White House to CAB concerning Trans American's 1955 revocation case.

The Chotiner hearings could well set the stage for the January hearings in the Florida Case and the strange moves against Harmar D. Denny may be explained when it's all over. ♦♦♦

## Neptune Equipped for Operation Deepfreeze

Lockheed Aircraft Service has modified a series of Navy P2V-7 Neptunes for use at the South Pole during Operation Deepfreeze this winter. In addition to installing skis for ice and snow landings, LAS also has provided cabin heat for the crew and facilities for pre-heating engines. Planes will be used for mapping and other scientific work in connection with the International Geophysical Year.





# New Security Policy: How Far Will It Go?

Pentagon Committee calls for drastic action against offenders on classified information;  
AIA president, Admiral Ramsey, says criticism of industry is unjustified.

By HENRY T. SIMMONS

A special Pentagon committee studying the problem of safeguarding classified military information dropped a bomb on the aircraft industry when it charged that U.S. defense manufacturers have been "leaking" information on new weapons to bolster their own prestige.

The committee, headed by Charles A. Coolidge, Special Assistant to Defense Secretary Charles Wilson, called for drastic measures, including revocation of security clearances and possible diversion of government business, to prevent companies from "leaking" information on new weapons. The group was appointed in August to investigate the unauthorized disclosure of classified information and to recommend ways to improve the security system.

• **Adm. DeWitt C. Ramsey, USN (Ret.)**, president of the Aircraft Industries Association, promptly branded "unthinkable" and "wholly unjustified" any suggestion that the aircraft companies have deliberately violated security restrictions to build up their own prestige. In a letter to Defense Secretary Wilson, Adm. Ramsey declared:

"The implication that our members have purposely violated security, in some cases, in order to build up prestige I regard to be wholly unjustified. To have done so might well have caused irreparable damage. It is unthinkable that such an idea could be entertained about the aircraft industry, just as such a thought about the military services and the press we consider totally unjustified."

## Vague on Names

The Coolidge Report singled out "industry"—without mentioning the aircraft industry by name—as well as trade and technical journals for some special criticism. It declared that some companies "in their desire to build up prestige . . . give out damaging technical information in their annual reports to stockholders, in advertisements, at business conferences and to trade and technical journals."

• **To halt such security violations**, the committee recommended: "More effective efforts should be made to educate the officers of offending companies, followed if necessary by the withdrawal of clearance of offending individuals, plus in extreme cases diversion of future business."

The committee was particularly

concerned about the volume of classified information which it insisted was appearing in trade and technical journals. In some cases, it said, the data disclosed "approaches complete specifications and detailed performance data of new planes or weapons—matters which are of the greatest help in enabling a potential enemy to attain superiority in that vital field by taking advantage of our progress or concentrating on counter-measures."

To stop alleged breaches by trade and technical journals, the group recommended "vigorous measures" by the Pentagon, including amendments to the Industrial Security Manual to prevent representatives of trade and technical publications from obtaining anything but unclassified information. In this connection it observed that the bulk of the "classified information" carried by the offending publications "appears to be derived from visits to manufacturing plants and conversations with manufacturer's personnel."

Although initial accounts of the Coolidge Report described it as being highly critical of overclassification of information by the military services and the Defense Department, when the Report became available it turned out that much of the "overclassification" the committee had in mind was that which probably still surrounds the venerable weapons of World War II.

Anyway, the group called for a determined attack on the tendency to overclassify information and to keep it classified long after it has lost all military value, and it recommended a variety of procedures which might be useful in this effort.

But the real significance of the report lay in its attack on the problem of safeguarding classified data and its demand for tough new sanctions to plug leaks. Among them:

• **Grand jury investigation** of reporters writing stories gravely damaging the nation's security where the source of such stories cannot be readily discovered through administrative machinery.

• **"Prompt and stern discipline"** for military personnel who leak stories, including a policy of holding commanders responsible for leaks within their commands.

• **New and vigorous machinery** in the Defense Department to investigate leaks, including courts of inquiry com-

posed of members of all three services in case of serious leaks.

• **All press interviews** of Defense Department personnel in the Washington area should be arranged through the Office of Public Information, and a "forceful statement outlining the differences between ordinary peace and the present situation from the point of view of information security should be prepared and given wide distribution to the press."

Secretary Wilson, in a letter to Coolidge, said he was "convinced that the great majority of the Committee's recommendations can be promptly implemented" and immediately appointed a three-man committee to review the proposals and prepare appropriate instructions or directives for implementing them. Chairman of this group is Mansfield Sprague, Pentagon General Counsel.

In his letter to Secretary Wilson, Adm. Ramsey blamed much of the Pentagon's security troubles on its futile efforts to preserve secrecy on information which cannot possibly be protected. "This applies, for example, to materiel which is already in full view on airfields or in public or semi-public places," he said. "It is unreasonable to expect our contracting members to deny or conceal the existence of such equipment under such circumstances."

## Cites Lack of Consistency

The AIA president sharply criticized the lack of consistency and uniformity in the implementation of Pentagon security policies and directives. "This tends to break down the entire system of security of information and places our member companies in difficult, and often embarrassing, situations."

As for the appearance of classified or marginal information in the trade and technical press, Adm. Ramsey expressed doubt that AIA members have "consciously" violated security in their dealings with informed writers. "We must remember that most of these writers are experienced people who are perfectly capable of drawing their own conclusions sometimes on the basis of partial information," he pointed out.

He emphasized that the aircraft industry is "anxious to cooperate, to the limit of its capabilities, in the safeguarding of vital information" and added: "We trust that the final outcome of your studies will establish clear and reasonable rules of classification." ♦♦♦



An Army design competition will be ordered soon for something like this two-man aerial jeep which features two ducted fans. Soldiers want a machine with an empty weight of 1,000 pounds and a payload of 500 to 1,000 pounds. They hope to have it ready for troop test by 1959.



One configuration which has been proposed to Army for a short takeoff and landing observation aircraft. Army wants a machine capable of 275-300 knots to avoid ground fire, yet able to get over a 50-foot obstacle in 600 feet.



Artist's conception of tandem and quad-rotor flying cranes. Army expects to hold a design competition for flying crane capable of lifting 8 to 15 tons and hauling loads up to 100 miles at 50 knots.

# How Army Views Its Future Flying Needs

The illustrations on these pages set forth the Army's near-future requirements for flying machines. They were first shown in October by Maj. Gen. Hamilton Howze, Army Aviation Director, in a speech before the U.S. Army Association. Some of them are published here for the first time.

With the exception of the two short takeoff and landing transports and the single vertical takeoff and landing transport, the Army presently has authority to design, develop, procure and operate all the aircraft pictured here.

Until the terms of the Memorandum of Understanding between the Army and the Air Force are changed, however, the soldiers are barred from development of the STOL and VTOL transports. That is because the memorandum limits them to fixed-wing aircraft with an empty weight not in excess of 5,000 pounds.

The Army has been trying for more than a year and a half to secure a revision of the memorandum permitting a more generous weight limitation on its fixed-wing machines. The matter has received long and active consideration from the Joint Chiefs of Staff, and there are signs that it will be resolved in favor of the Army.

Although a package deal involving settlement of a considerable number of points of issue between the Army and Air Force over the former's aviation role has been discussed in the past, it now appears that only the memorandum will be affected.



Concept of an STOL transport with a four-ton payload capacity. It should get over a 50-foot obstacle in 500 feet and have a speed of 250 knots.



An STOL transport with a capacity of two and one-half tons. It should have a speed of 200 knots and get over a 50-foot obstacle in 500 feet.



Two possible configurations of a machine that would have a two-ton capacity in VTOL work and four tons where short takeoff runs are possible. It could carry up to 40 troops at speeds of 200 to 250 knots.



# Latin America's Big Problem: Dollars

By ANTHONY VANDYK

MIAMI BEACH—Increasing inroads that the European aircraft industry is making in the Latin American market are likely to be stemmed as a result of the Latin American Aviation Conference organized here by the Export Committee of the Aircraft Industries Association.

More than 100 leaders of military and civil aviation in Latin America and a similar number of U.S. specialists poured out their opinions in a frank discussion of mutual problems. The three-day conference touched on every major area of interest and successfully pointed up those where particular attention is needed.

It was clear by the time the conference ended that much has to be done if the U.S. is to continue in its traditional role of supplier of aircraft to the air forces and airlines of Latin America. European nations are giving their aircraft industries far greater financial support to foster exports than the U.S. industry can obtain. By offering easy financial terms the European manufacturers have a built-in advantage in selling their products in Latin America.

• From the outset of the conference it was obvious that finance is the number one problem for Latin American airlines and air forces. Robert E. Smith, general manager of LACSA, Costa Rican airline, pointed out that in order to compete with U.S. and European car-

riers, they have to re-equip and to do so must find financial backing. While new investment capital can be found, all capital demands cannot be met with equity issues.

The airlines must therefore turn to other sources for their finance. Aircraft manufacturers in the U.S. have shown reluctance to assist in financing, while such credit institutes as the Export-Import Bank and the World Bank have only a limited use. The former has not in the past granted aircraft loans of longer than five years although this is likely to be increased to seven years. The World Bank has only made two aviation loans, the last five years ago, and apparently has a present policy against granting such loans. Reasons for the lack of enthusiasm of the Export-Import and World banks, according to Smith, include the opinion that most national airlines do not contribute directly nor strongly enough to the basic economies of their countries and that their operations, particularly when government-owned or subsidized, are of mere prestige value.

"This is certainly confusing the exception with the rule and grossly underestimating the importance of Latin American airlines in the national economies," the LACSA general manager asserted. He also noted that institutional loans usually require government or bank guarantees which are most difficult to obtain.

Smith observed that U.S. commer-

cial banks are reluctant to make "over the border" loans, and when they do, the terms are very short. He hoped that insurance companies might help Latin American carriers in the way that they have financed jet re-equipment programs for certain major U.S. carriers. There seems little indication, however, that such assistance will be made available.

• Smith believes chattel mortgages in proper proportions should be enough on new equipment, because not only have original costs been continuously sustained in market prices and are likely to be so in the foreseeable future, but the newest aircraft are demonstrably money-earners and self-amortizing with adequate credit terms.

Although State Department's International Cooperation Administration may be able to help, he noted that "its present organization is not particularly designed for our needs."

The LACSA executive told the conference that financial terms "may well be a determining factor" in choosing between U.S. and foreign equipment. This thinking is not confined to the airlines. A Colombian Air Force spokesman told the conference that "for want of finding a favorable solution to their problems in their own American continent, the Latin American countries have had to have recourse to other continents." Certainly the purchase of non-U.S. equipment by the Latin American nations is detrimental to standardization by the air forces of North and Latin America and therefore prejudicial to hemispheric defense.

• It is an unfortunate fact that the Latin American air forces have fared far worse in U.S. military assistance programs than their European counterparts. During the period 1950 through 1955 some \$124 million for grant-aid ("give-away") and \$52 million for reimbursable aid were authorized for the Latin American countries, less than 2% of the total aid given to the rest of the world.

For fiscal 1956 grant-aid for the Western Hemisphere is set at \$13 million as against \$617.5 million for the European area, \$181.2 million for the Near East and \$583.6 million for Asia.

These figures speak for themselves in pointing up the Cinderella status accorded to the Latin American air forces. Not only has financial assistance been low but the U.S. has not given the Latin American air forces a good deal on the availability of modern types of aircraft. It will be three or four years before the Pentagon will allow modern jets to be delivered to Latin America. Even jet



Among most active participants at Latin American Aviation Conference were (left to right): Carlos Ramos, General Manager of Aeronaves de Mexico; Robert E. Smith, General Manager of LACSA; and Alan V. Abels, Commercial Sales Manager of Convair.

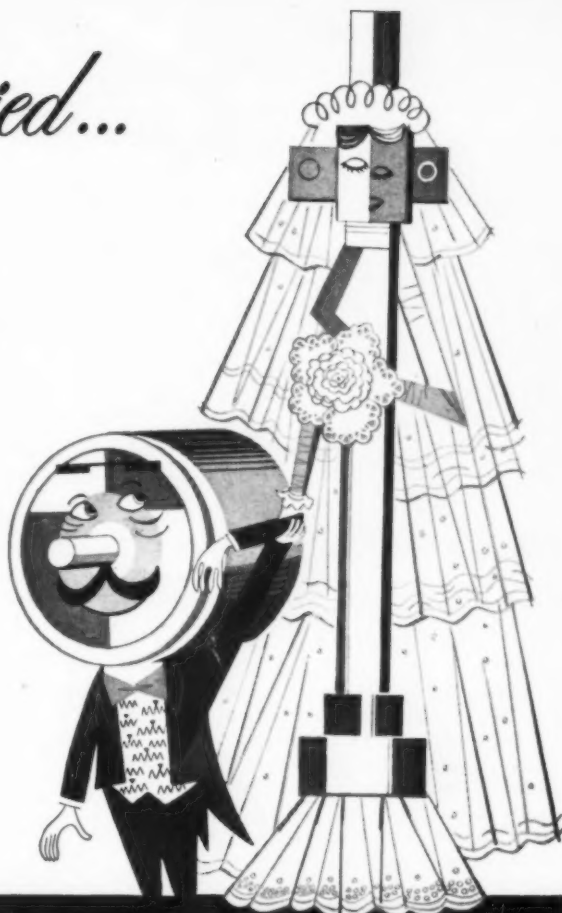
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Sikorsky Aircraft's new S-58 demonstrator was used to convey delegates between Miami International Airport and Bal Harbour Hotel, location of Latin American Aviation Conference.

trainer deliveries have not yet been completed.

Military and civilian spokesmen from Latin America were unanimous in their criticism of spares availability and supply arrangements. Particularly bitter comments were heard on the sub-quality parts supplied by certain unscrupulous dealers. In order to keep their obsolete aircraft flying, Latin American operators often must pick up spares where they can be found and some dealers take advantage of this situation to the full.

• **Robert E. Anson**, who heads up the SALA overhaul and maintenance in Costa Rica, said that Latin Americans had been "stung many times" by being sold defective parts. A Venezuelan Air Force spokesman joined with Anson in asking the Aircraft Industries Association to "eliminate the unscrupulous aviation dealers from the Latin American market."

The spokesman admitted that the Venezuelan Air Force has been a victim of its own practice of accepting the lowest bids for parts. He explained that "a few unprincipled companies concerned with quick one-shot profits" quoted prices on some items with a fair margin of profit and "fantastically low" prices on others which they knew they could not supply—merely to enter bids.

The conference was advised by a CAA representative that the agency has received many complaints about unsatisfactory spares supplied from U.S. sources. He recommended that customers specify in their purchase orders that all items be certified by CAA as

airworthy—a service furnished free of charge by CAA on request.

#### That Old Red Tape

Red tape involved in getting aircraft and spares out of the U.S. and into the Latin American countries was the subject of considerable adverse comment. It was suggested that State Department might be able to relax its export license requirements for emergency shipments of spares of low value.

Latin American nations were asked by U.S. suppliers to try to simplify their customs formalities to facilitate quick deliveries. The USAF, it was disclosed, is helping to slash red tape by setting up an "over the counter" spares depot at Caribbean Air Command's headquarters in the Panama Canal Zone to handle emergency requirements of Latin American air forces against cash payment.

• The conference learned of the variety of ways in which Caribbean Air Command is assisting the Latin American air forces. The command, incidentally, played a material part in assuring the success of the conference by flying the Latin American military representatives to Miami.

Caribbean Air Command spokesmen, in telling how the command implements the U.S. assistance effort in Latin America, pointed out ways in which the air forces could help themselves. It was suggested that civil and military training could be combined. More facilities should be provided to store supplies and accomplish maintenance. More complete aircraft records

ought to be kept. Fuller consultation should be made with CAirC before entering into new and ambitious programs. And better use should be made of personnel trained by the USAF.

Latin American military representatives acknowledged the good job done by the USAF for them but suggested that improvements could be made. For example, advance information on aircraft deliveries is not always given, so that programming is rendered difficult.

The USAF was also asked repeatedly to make available modern aircraft for standardization purposes. It was pointed out that the replacement of obsolete aircraft would also eliminate the spares supply problem.

• It was generally agreed that a light jet trainer is needed for the Latin American air forces to replace present piston engine types. Apart from jet combat aircraft, the Latin American air forces need electronic equipment and radar to assure their combat readiness. Such complex equipment will bring additional training and maintenance headaches, it was acknowledged.

#### DC-3 Replacements Needed

The airlines' main requirement is for DC-3 replacements. There was lack of unanimity on what type and size of aircraft is required for this purpose. A spokesman for REAL-Aerovias Brasil suggested that DC-3s would still be flying in 1970 and that their replacement would be present, larger piston-engine aircraft such as the DC-4 and DC-6B. Several references were made to the need of keeping the size of aircraft down so that frequencies would not be affected. One spokesman called for a 16-seat DC-3 replacement while others thought 40 seats about right.

Because individual Latin American air forces and airlines often have difficulty in making their individual requirements appreciated, the conference paid particular attention to a Colombian Air Force proposal for the establishment of an advisory body serving both North and Latin American aviation. Proposed as a name was: Organization of Inter-American Aeronautic Cooperation.

The group would deal with such matters as procurement of aircraft and spares, service, means of payment, construction and expansion of airfields, expansion of airlines and establishment of new carriers, and similar subjects affecting both civil and military aviation.

The organization would also aid in the evaluation of new equipment projects, supplies of spare parts and other areas in which individual nations have difficulty in securing reliable information.

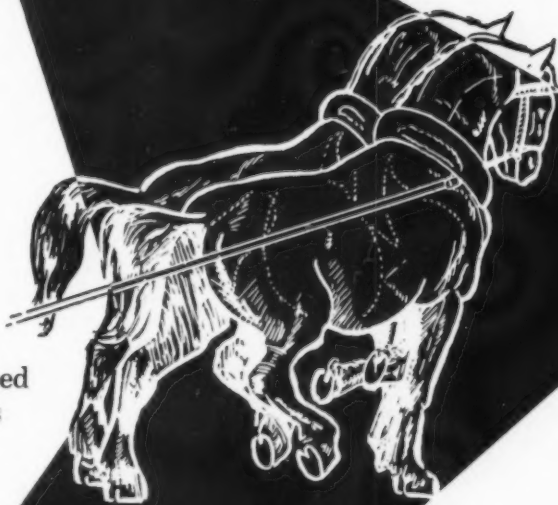
• Constructive proposals such as the one by the Colombian Air Force did  
(Continued on Page 29)



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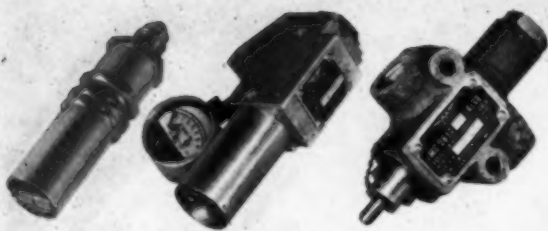
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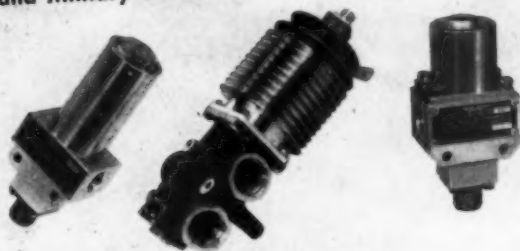
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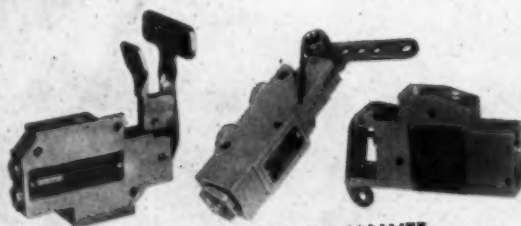
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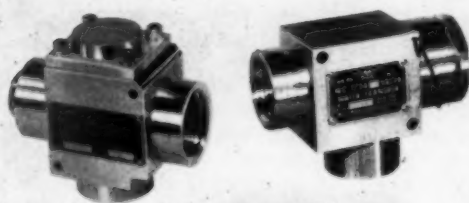
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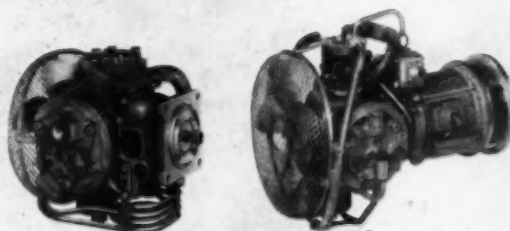
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(Continued from Page 26)

much to make the Latin American Aviation Conference of value. Attendance by military representatives was good, although the type of representation varied from air force to air force. Some sent commanding generals while others delegated junior officers to attend. Latin American airlines were less well represented. In fact several major carriers—Avianca, LAV and Panair do Brasil, for example—were unrepresented.

The U.S. aircraft industry had representatives from most major companies with export interests. The only big manufacturer missing was Douglas Aircraft Co., an absence that was particularly regretted by conference participants since Douglas equipment predominates among Latin American airlines and is widely used by air forces in South America. Representing the U.S. State Department at the conference sessions was an official of the Munitions Control Office.

None of the Aviation Division staff of the State Department were present, presumably because of the international aviation meeting in Washington scheduled by State on exactly the same dates as the Miami session. Although an official of State's International Cooperation Administration was assigned to the conference he was not present when questions were asked about ICA.

#### Conference A Success

Despite spotty representation in some areas and inadequate language facilities (there was no interpretation and few of the papers were available in translated form) the conference was a success. Particularly valuable contributions were made by representations of

the Colombian, Nicaraguan and Venezuelan air forces who showed no hesitation in speaking frankly about their problems.

On the civil side it was the smaller airline representatives that had the most pointed remarks to make—Aeronaves de Mexico's Carlos Ramos and LACSA's Robert Smith being the prime examples.

For the U.S., banker C. Carl Wedel, Convair's A. W. Abels, Boeing's J. O. Yeasting and United Aircraft's J. J. Shea did particularly well at explaining the problems confronting U.S. financial institutes and manufacturers in helping the Latin American nations. The manufacturers' representatives, incidentally, made it clear that they have financial problems enough in their own operations without getting into providing money to assist Latin American purchasers.

Of the U.S. military spokesmen, Caribbean Air Command's Major General Truman H. Landon made a particularly good impression. He commanded the particular respect of the Latin American delegates for having mastered the Spanish language.

The conference was a success primarily because of the planning carried out originally by Convair's R. B. Swanson and subsequently by Westinghouse International's Charles Shuff in association with AIA export director Irving Taylor. All present at Miami Beach hoped that the results will be sufficient for AIA to make the conference an annual occasion. In exchanging parting remarks participants were optimistic enough not to say goodbye but "Hasta la Vista"—until we meet again. ♦♦♦

## Dispose of Old Plants, AMC Official Warns

Aircraft industry will be facing a new problem—over-facilitization—unless manufacturers start disposing of older plants, predicts Air Materiel Command's procurement and production chief, Maj. Gen. David H. Baker.

Addressing an Aviation Writers Assn. luncheon in Washington, Gen. Baker noted that this problem will become extremely important as missile procurement increases. Since most missiles demand new brick and mortar for economic production, existing aircraft plants "will find themselves running out of business."

Unless manufacturers step up their plant disposal activity, the AMC official warns, "we will find an increasing share of the taxpayer's money going into non-productive overhaul." He also pointed out that withdrawal of government plants from active production is no solution, since these in many instances are more modern than the facilities owned by the contractors themselves.

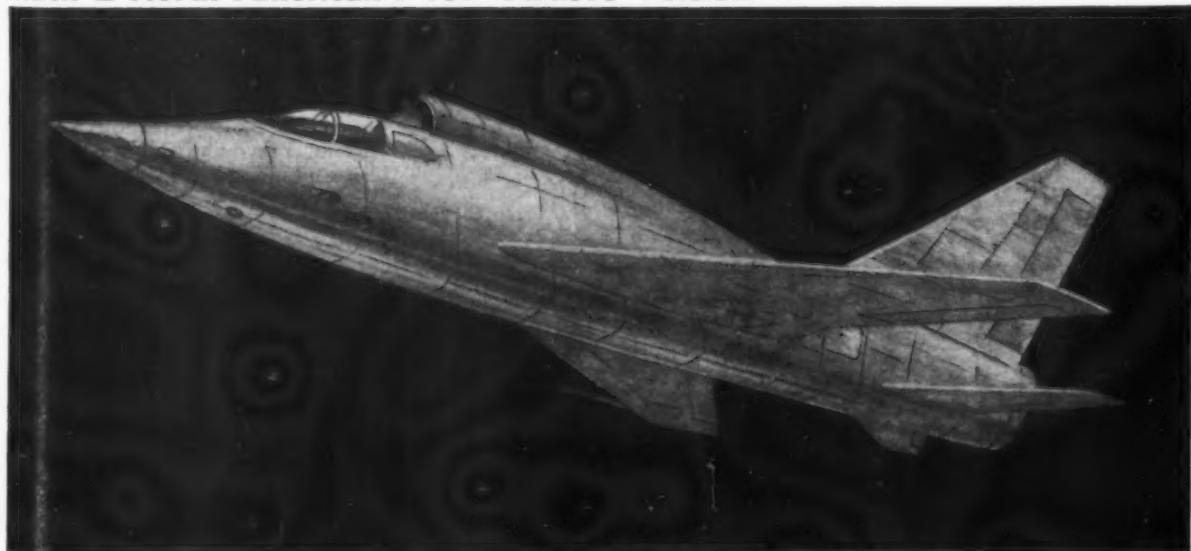
Other points made by Gen. Baker:

- Missile complexity calls for much greater integration of all details of a weapons system than ever before—demanding a greater degree of cooperation between industry and government.

- Experience so far in missile procurement indicates it is now possible to forecast more realistically future missile availability for operational purposes.

- Any efforts by industry to overcome the missile reliability problem will certainly be repaid many times in new business as missile production increases. ♦♦♦

## Mach 2 North American F-107—Artist's Version



First of three North American F-107 supersonic prototype fighter-bombers on order has attained Mach 2 in level flight. Test was made at Edwards AFB, Calif., at 40,000 ft. and in shallow climb. Novel feature of F-107 is intake for its Pratt & Whitney J75 aft and above cockpit. NAA reportedly is pushing medium range interceptor version. (An AMERICAN AVIATION artist's conception.)



# Record-Breaking \$9-Million Order For Radars to Go to Raytheon

By LOIS PHILMUS

CAA has taken two giant steps forward in its big push for modernizing the airways. In a two-day period, CAA announced:

- Arrangements for procurement of 23 long-range radars from the Raytheon Manufacturing Co. with deliveries to start by summer, marking the largest single purchase in the agency's history.

- Major evaluation of three experimental runway lights to determine new U.S. civil/military standards for an improved system. The CAA program will get started this month at Andrews AFB in cooperation with the Air Force.

While the contract for the radar will not be concluded until the end of the year, CAA has issued a letter of intent to Raytheon. Cost negotiations were scheduled to begin this week. Final contract is expected to be for \$9-to-\$10 million for a minimum of 23 radars and possibly a couple of more.

First unit will be scheduled for July 1957 delivery, with rates stepped up to from two to three per month thereafter. Under this schedule, total implementation of the fiscal 1957 program can be expected around December 1958 or early 1959. Raytheon's contract will also provide for installation of scopes, auxiliary and antenna remoting equipment. The radars will be built to CAA equipment specifications.

The balance of the radars for the first section of the three-year program, which calls for providing 28 in all, will come from military radars. About five

locations may be found usable. A CAA-Air Defense Command study of specific locations has been started.

- The Raytheon units, which will feature circular polarization to reduce precipitation clutter and moving target indication to filter out fixed objects, will be installed at 23 of the following locations (with the balance using ADF equipment):

Washington, Los Angeles, Atlanta, Oakland, Detroit, Fort Worth/Dallas, Cleveland, Pittsburgh, Indianapolis, Jacksonville, San Antonio, Miami, Kansas City, Benson, N. C., Seattle, Boston, Memphis, St. Louis, New Orleans, Atlantic City, Denver, Albuquerque, Salt Lake City, Houston, El Paso, Buffalo, Spokane, and Phoenix.

Installation is under way in Chicago and one was completed earlier in the year in the New York Center at Idlewild. (See map.)

- CAA's evaluation of new runway lighting systems will be welcomed by pilots. Professional pilots have labeled runway illumination provided by present systems as the "weak link" in the entire system with the runway surface likened to "a black pit." The system also has been criticized for failing to show clearly the aircraft's height above the runway.

The three systems being studied by CAA are all designed to place illumination directly on the runway surface itself. The three systems are:

- New Sylvania side-lighting design which features newly developed

high intensity fluorescent tubes mounted in front of reflectors along the edge of the runway.

- The Dutch-developed Elfalka system, evaluated by the Navy, which is buried in the runway itself and protected from impact by a set of steel bars.

- A British development, also of the buried species, which is protected from impact by a cast-iron hood with light reflected from a sealed-in prism.

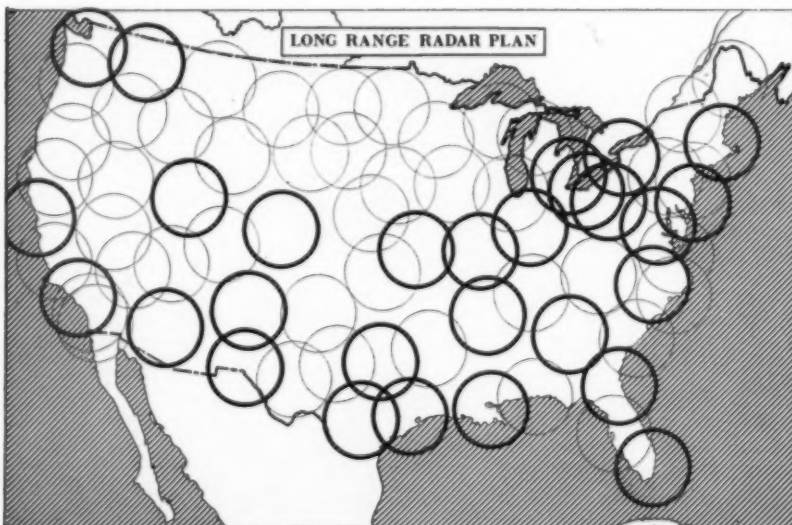
The latter two systems, which rise about an inch from the runway surface, appear to pilots in the form of short bars of light.

The Sylvania system will be installed on an active runway, with the other two placed alongside a runway. All three will mark the first 3,000 ft. of runway for purpose of the tests, with various spacings and positions tried out for most effective results.

The three will be judged on four points: (1) effectiveness in completing approach; (2) usefulness during touchdown; (3) steering guidance provided; and (4) benefits, if any, for climb-out after a missed approach.

The Air Force will provide jets for the test, CAA DC-3s and it is expected that airlines and business aircraft will participate on a voluntary basis. Helicopters also will be used. Tests will be carried out in all possible weather conditions.

Timetable calls for starting the tests this week with enough information gathered for some standards to be developed by the end of the month. CAA already has installed an ILS on the main runway, as well as a high-intensity approach centerline system, to be used in the program. ♦♦♦



Total radar coverage of the U.S. moved closer to reality as CAA announced its largest single electronic purchase in history: some 23 long-range radars at an expected cost of about \$9 million for its fiscal 1957 share of the three-year plan. Heavy circles encompass the 28 areas scheduled for coverage first, the 23 CAA radars plus an expected five Air Defense radars. Lighter circles indicate future coverage to be operational by 1965.

## Temco Gives First Details on XKDT-1

First design and performance details of the XKDT-1, high performance missile target being built for the Navy, have been disclosed by Temco Aircraft Corp.

The XKDT-1, Temco said, is comparable in size and weight to present air-to-air missiles and can be launched from missile-carrying Navy planes. It is rocket-powered, has swept wings and will operate to altitudes exceeding 50,000 ft.

Speed of the new drone is pegged in the sonic region and powered flight duration is about eight minutes. It has a self-contained guidance system to maintain a constant course and altitude, obviating need for airborne or ground stations for support of operation.

Navy order of \$1,315,000 covers an evaluation quantity to be tested at Naval Air Missile Test Center, Point Mugu, Calif.

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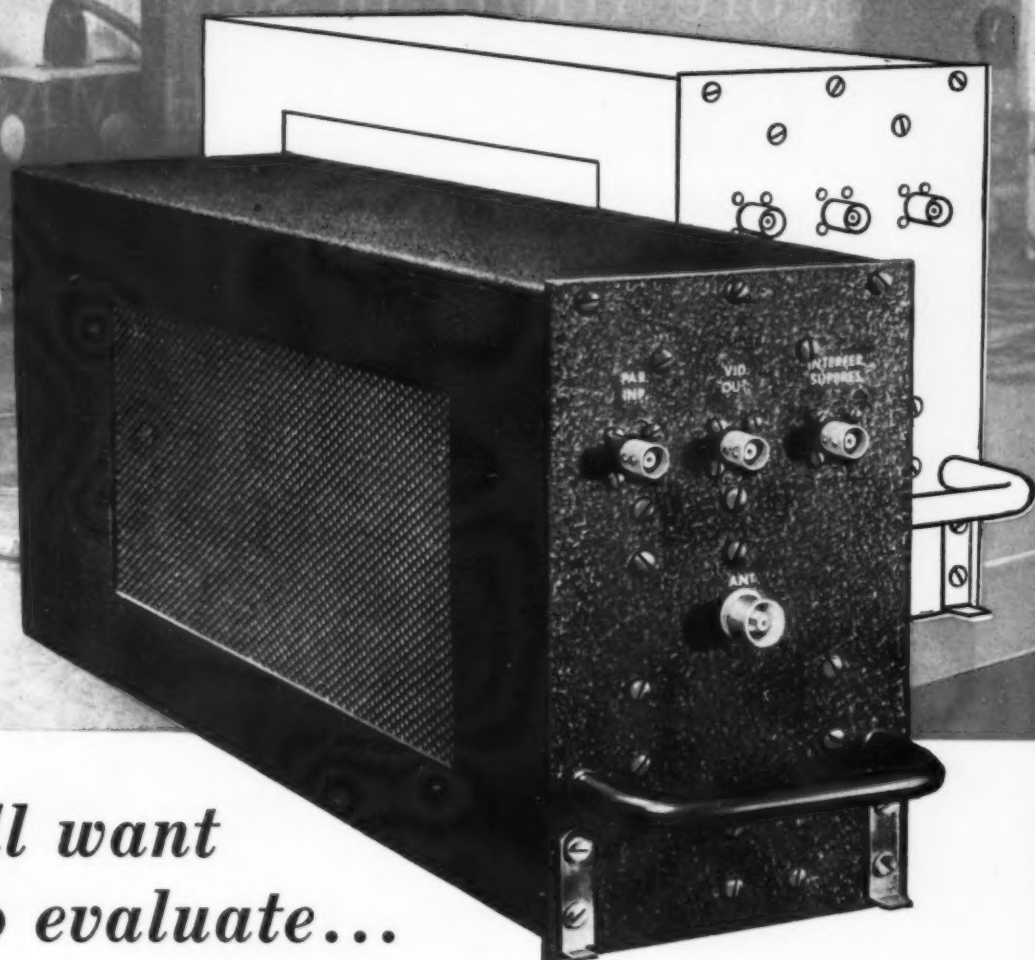
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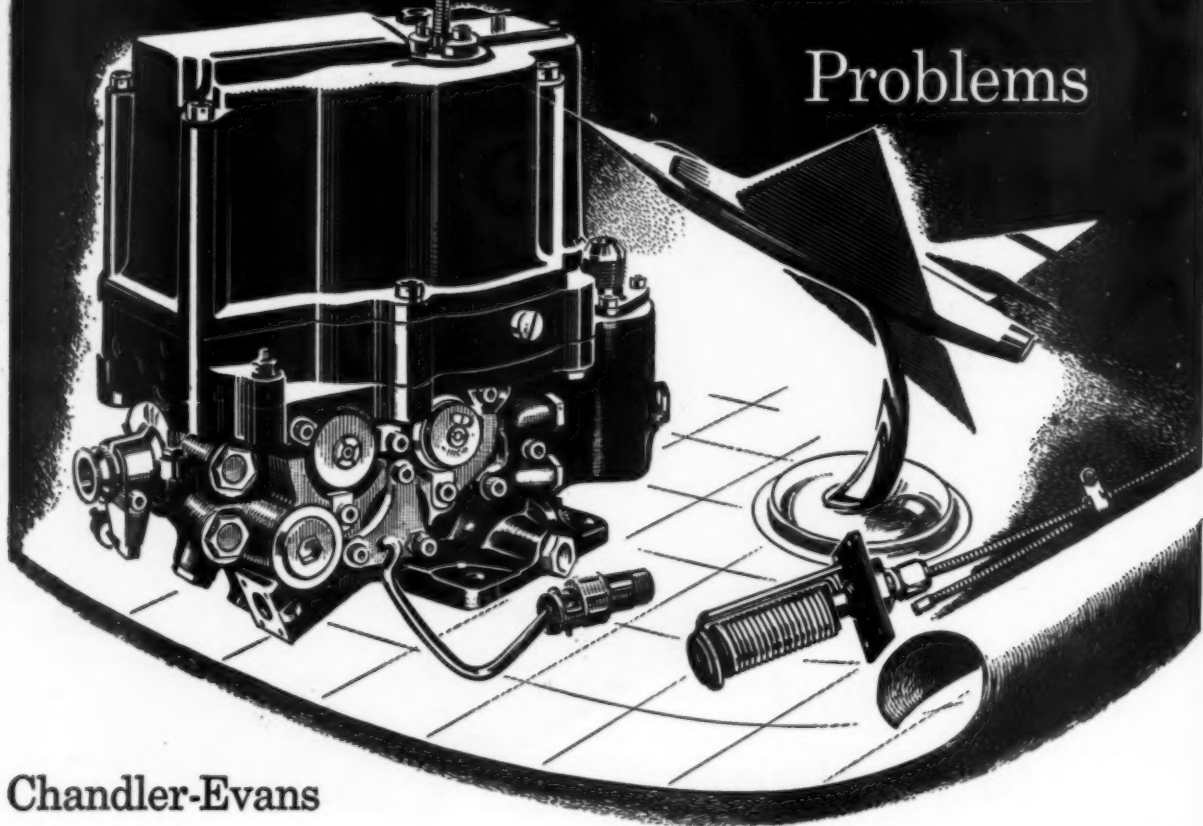
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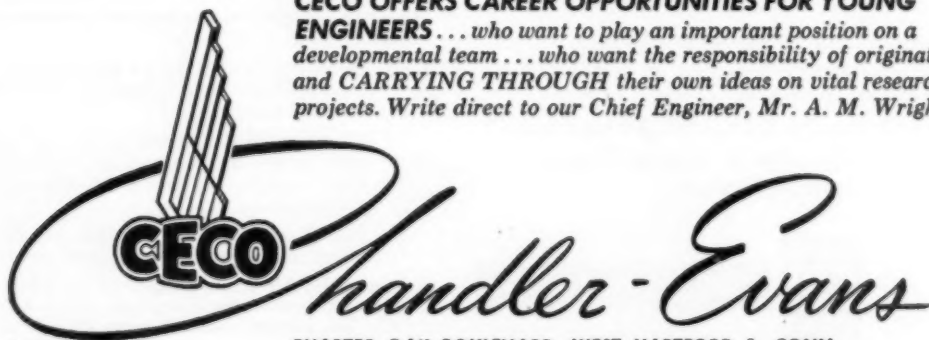
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## Lockheed to Seek CAA Certification Of 1649A with Hollow Dural Props

Lockheed Aircraft Corp.'s long-range Model 1649A, now in flight test, will be submitted first for CAA certification with Hamilton Standard's new hollow dural propellers, 43H60/HA 17A34, installed.

These have been specified by TWA for the 24 aircraft it has ordered and they mark the first such installation for operation in an airline fleet. The saving in weight is 680 pounds per airplane.

A follow-on certification will be made with the 1649A equipped with Hamilton Standard's 43H60/6993-B4 solid dural propellers installed. As the designation number indicates, the hubs are the same. The blades are interchangeable, and CAA certification of the solid dural propellers can be accomplished on a comparative basis requiring a limited flight test program.

Blade interchangeability also means Hamilton Standard is able to offer the solid variety as a back-up for the new-type hollow dural blades if a later switch is desired.

Moreover, LAI, which has ordered its Model 1649As for delivery with the solid dural blades, will be able to change over to the hollow dural blades at a later date, and may do so. There is a price saving in buying the solid dural blades. The hollow blades cost almost double.

### Milestone in Design

Hamilton Standard feels that its pioneering with hollow dural marks a milestone in propeller design. The weight saving in the case of Lockheed's 1649A is the equivalent of more than three passenger fares. In addition, Hamilton Standard reports stresses in the blade are lower.

The hollow dural blades are produced by an extruded reformed process. They are nickel-plated to prevent erosion.

A third propeller configuration of the 1649A will be Air France's, using Curtiss-Wright hollow steel blades.

• **Herman Salmon**, Lockheed's chief engineering test pilot, says the 1649A is the quietest four-engine airplane he has test flown. When the soundproofing is installed, Robert E. Gross, Lockheed chairman and chief executive, believes the Model 1649A will prove to be the quietest of any airline plane.

The three-bladed prop is bigger in diameter than that of the Model 1049G Super Constellation, measuring 16 feet 10 inches in diameter as compared to 15 feet 2 inches. But it is a slower prop and it has a clearance from the fuselage of 62.6 inches. A lower propeller-to-engine gear ratio, from .4375 to .335,

will be reflected in a quieter cabin interior.

Lockheed's latest transport incorporates Curtiss-Wright's advanced R-3350-EA2 engines, which have a takeoff rating of 3,400 hp to 4,000 feet and improved METO ratings of 2,860 hp at sea level and 2,920 hp at 4,800 feet. Latter, incidentally, represent an additional advance since first announcements of this model of the Curtiss-Wright engine. An increase allowed in rpms—from 2,600 to 2,650—resulted in a boost from 2,800 to 2,860 hp in the METO rating at sea level and from 2,850 to 2,920 at critical altitude.

• **Lockheed has mapped out** a flight-test program calling for 86 hours with the resident airplane before flight testing for CAA certification gets under way. The No. 2 airplane also will be available in expediting the flight-test program while the No. 3 airplane is the static-test article. No. 4 airplane has the TWA interior. CAA certification of the TWA version is anticipated by April 1, 1957, with delivery of the first airplane scheduled for April 12, 1957.

First Air France aircraft is No. 11 on the line. Involving the changeover to the Curtiss hollow steel props and the incorporation of various changes for international service, such as the installation of four lavatories, CAA certification of the Air France configuration is scheduled to be accomplished by May

31, 1957, with delivery of the first plane set for June 20.

Combining a new laminar flow wing and the EA2 turbocompound engines, the latest model in Lockheed's line of triple-tailed transports will have a cruising speed of 350 mph and a maximum range of 6,300 miles. Lockheed calculations show the airplane is capable of carrying a domestic payload of 17,130 lbs. or an international payload of 16,428 lbs. at maximum cruise power 4,500 miles.

Maximum takeoff weight of the 1649A is 156,000 lbs. and maximum landing weight is 123,000 lbs. Zero fuel weight is 116,000 lbs. and fuel capacity is 9,600 U.S. gallons. Typical domestic standard fare version seats 64 and has four lounge seats, while a typical international configuration has seating for 58. The domestic 1649A has 557 cu. ft. of cargo space, the international version 593 cu. ft.

• **Points of difference** in the wing of the 1649A as compared with the Model 1049G Super Constellation include:

• Root thickness to chord ratio of 15% vs. 18%.

• Higher aspect ratio—12 vs. 9.17.

• Wing span is 27 feet greater and wing area is 200 sq. ft. larger.

• Integrally stiffened skin between beams on upper surface as well as lower.

• Trailing edge incorporates improved beaded inner skins.

Lockheed has sold a total of 44 Model 1649As, as follows: TWA, 24; Air France, 10; LAI, 2; Lufthansa, 4; Varig, 4.

## Sam Saint Joins AAP as Contributor

S. P. (Sam) Saint, a veteran airline pilot of 17 years' experience and outstanding air traffic control authority, has joined AMERICAN AVIATION's staff as a contributing editor. His first article will appear in the Dec. 17 issue.



SAINT

Now back in flight status as a captain with American Airlines after a seven-year role with Air Transport Assn. as ATC specialist, Sam Saint will bring AMERICAN AVIATION's readers something new in on-the-spot coverage of vital air traffic control and air navigation developments and pilot operational problems.

Saint's wealth of background experience to fill this assignment is unparalleled. A pilot for more than 26 years, he has been actively working on ATC problems since his first days of flight duty with AA in 1939. As far back as 1945, he first went on record

forecasting the eventual need for positive traffic control, a policy now being recognized 11 years later by top government agencies.

His background in ATC is by no means confined to commercial interests. In 1945-46, he served as consultant to the Air Transport Command and held a security status as high as top secret on an interim basis.

In another military assignment, as a consultant to the Navy, he came up with suggestions that doubled the landing rate of aircraft in 1948 carrier-controlled approach (CCA) experiments.

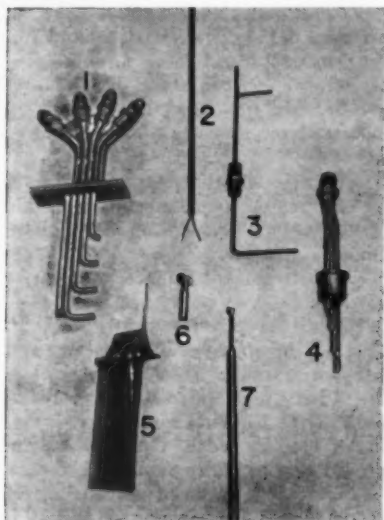
Since 1949, Saint directed ATA's air navigation and traffic control division; served as consultant without compensation to the Air Navigation Development Board; and for one period represented the Air Line Pilots Assn. on the Air Coordinating Committee's Nav Panel while on ATA's payroll. He headed one ACC special working group, was vice chairman of another, and served on numerous other committees.



## Small-Diameter Tubing Solves Thermocouple Production Problem

Marlin Manufacturing Co. of Cleveland, producer of Marlox thermocouples for jet engine testing and other high temperature applications, has found a ready-made answer to its production problems.

The solution: Use of small-diameter, cold drawn steel and Inconel tubing supplied as "standard" in sizes from as small as .015 in. diameter up to 1/2 in. by Superior Tube Co. of Norristown, Pa.



Typical uses of Marlox thermocouples: 1—pressure rake; 2—Marlox wire; 3—pitot static tube; 4—thermocouple rake unwired; 5—instrumented turbine blade; 6—pressure probe; and 7—sensing probe for gas or liquid flow.

Marlin produces the thermocouples as probes in five sizes ranging from .040 to .250 in. Since they are usually inserted through drilled holes in test engines, outside diameters must be identical to those of the drilled holes

to minimize heat loss. For some applications they are required to fit standard tube fittings to facilitate installation.

• In thermocouple production, Marlin process calls for insertion of the two wires through evenly spaced holes that run the full length of ceramic tubing. The loaded ceramic is then inserted in lengths of the Superior tubing and the tubing is swaged.

This last process compresses the tubing and crushes the ceramic, packing it tightly to hold the wires in place.

Since the metal sheath is reduced in size by swaging, it must be slightly larger initially than the diameter of the finished thermocouple. If it is too much larger, it calls for a greater percentage of reduction, thereby slowing production.

And the tubing must be held within close dimensional tolerances to attain the precise amount of compression needed to powder and pack the ceramic tightly. In this operation, the thermocouple wires must not be stretched. These wires are carefully calibrated for a given length to provide accurate temperature readings and stretching affects this accuracy.

In addition to its stringent tolerance and size requirements, Marlin needed tubing free of impurities that might carbonize in high temperature locations where the probes are used. Since the tubing is packed tightly with insulation, there is no oxygen present to burn off any free carbon—and unburned carbon can cause short circuits.

• Normally, to meet the varying specifications of its customers, Marlin needed the tubing in four stainless types (304, 310, 321 and 347) and in Inconel.

To isolate a single source for this

tubing meant simplified purchasing; to locate a producer that could meet all specifications with a standard tubing line would eliminate charges for production "extras."



Swaging operation crushes ceramic insulator inside small-diameter tubing.

Marlin's president John Tymkewicz found this single source of supply in Superior Tube Co. With the economy and efficiency of production this has made possible, the firm now turns out the thermocouples in random lengths ready to be cut to size to fit a customer's particular application.

## UAC Completes Three New Windtunnels

United Aircraft Corp. has completed installation of three new blowdown windtunnels in the high-speed laboratory of its research department. They cover airspeeds ranging from Mach 0.5 to Mach 10.

New test installations are so designed to cover a segment of the speed range of present and future aircraft and missiles. A transonic unit is rated for Mach 0.5 to 1.5 testing, a supersonic tunnel extends speeds up to Mach 5, and a hypersonic facility handles the Mach 5 to Mach 10 range.

## French Plane, HD 32, Crashes Off Brazil

A prototype HD 32, French "DC-3 Replacement," crashed October 30 in the bay of Rio de Janeiro during a demonstration flight, killing a Brazilian Air Force passenger.

Although formal investigation is continuing, French Aircraft Industries Association has unofficially blamed poor visibility, including low ceiling, fog and a still sea, as causes of the incident. These factors, it said, created a form of mirage that made the surface of the bay almost invisible and led to error in judging altitude.

The HD 32 was on an extensive demonstration tour of Brazil.

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"There never was a good knife  
made of bad steel"

Benjamin Franklin



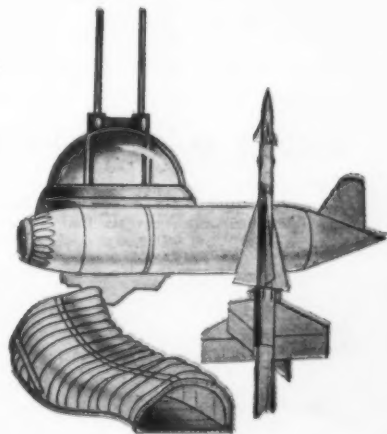
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## How Ford Broke Testing Bottleneck

Engineers of Ford Motor Co.'s jet aircraft engine division have solved a weighty problem of making hardness tests in its second-source production of Pratt & Whitney J57 engines.

Each component—fabricated of 410 stainless steel—weighs over 200 pounds and is 40 inches in diameter. Obviously, a piece of this weight and size is hard to handle on a bench-mounted Rockwell hardness tester. And because of the intended use of the component, it is impossible to cut small specimens from it.

Yet every component produced must be checked for hardness and comply with Air Force specifications—in this case, Rockwell C25-33. If not within these specs, the parts would not have the tensile strength demanded, and conceivably could fail under operational loads.

• One answer considered at Ford was to construct an elaborate fixture for a bench-mounted Rockwell tester. Another was to build a special Rock-

well machine just for this particular operation.

Both of these ideas were finally discarded as too expensive. Neither would have eliminated transporting the 200-pound parts to the tester.

The solution, supplied by the quality control division of Ford's standards and methods department, proved to be a portable hardness tester. Using a unit built by Riehle Testing Machines Div., American Machine and Metals, Inc., Ford now takes readings at several points on the flange and adapters of every jet piece it produces.

• The intricate design of the flange requires that checks be made with the testers in various positions. But this poses no problem, as the Riehle test unit can be used at any angle without affecting accuracy.

Testing is scheduled at any convenient time after hardening and prior to final machining. And since the unit weighs only 3 lbs. 6 oz., it is easily carried from one part to the next.



Ford inspector checks J57 flange with Riehle portable hardness tester.

All hardness tests on the jet pieces are made by a regular floor inspector. Skilled technical personnel are not needed to operate the portable devices.

## AiResearch Heat Exchanger Cools C-105

AiResearch Manufacturing division of The Garrett Corp. has delivered a newly developed heat exchanger, described as the largest stainless steel unit ever manufactured for aircraft use, to the A.V. Roe Co. to supply cool air to the cockpit of the Canadian manufacturer's new C-105 supersonic, delta wing fighter.

Other items developed for the 34-ton C-105 are five oil coolers, a cooling turbine, two actuators and an electronic temperature control.

The new air-to-air heat exchanger marks a new series of units to be manufactured by AiResearch, according to S. K. Andersen, assistant chief engineer for heat transfer. Utilizing plate and fin construction, the thin-gauge segments of the cooler are uniformly

bonded to minimize leakage and provide strength over the large surface areas.

• AirResearch employed the new vacuum brazing technique to acquire this uniformity. By brazing the core of the heat exchanger in a vacuum, complete homogenous bonds were produced to remove impurities and gases, which otherwise might cause contamination and leakage.

The new AiResearch unit operates continuously, cooling compressed air at temperatures as high as 920° F and at pressures up to 130 psi. This heat and pressure required the use of stainless steel instead of aluminum.

Hot air will be bled from the C-105's jet engines and flowing through the heat exchanger will be cooled by air

ducted from outside the aircraft. As part of the airconditioning system, the unit will be located between the engine bleed points and an AiResearch cooling turbine. The turbine will force the cooled air into the cockpit.

## GE Opens \$1-Million Lube, Bearing Lab

General Electric Co.'s General Engineering Laboratory at Schenectady, N.Y., has opened a \$1-million bearing and lubricant research center. The 10,000-square-foot facility will work on problems ranging from household appliances to hypersonic missiles.

At the moment, the research center's staff consists of 30 people, of which 14 are engineers. This staff is expected to double in the next few years. In addition, center will be able to draw on the over-all facilities of the 1,300-man General Engineering Laboratory.

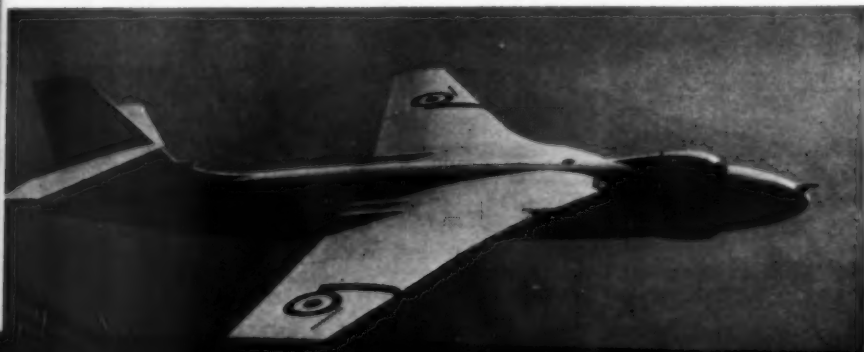
Among lines of research currently being carried out are highly efficient air bearings where air (or some other gas) is used to keep apart two surfaces in relative motion.

Scientists at the lab figure current research into more or less conventional liquid (petroleum and synthetic) lubricants will be developed to operate in temperatures up to 1,200°F, compared to about 400°F now. After that must come new solutions such as the air bearing and solid lubricants.

GE claims that its new research center is the most comprehensive of its kind in American industry and may be the best in the world.

## Valiant Mark I with Refueling Nose Probe

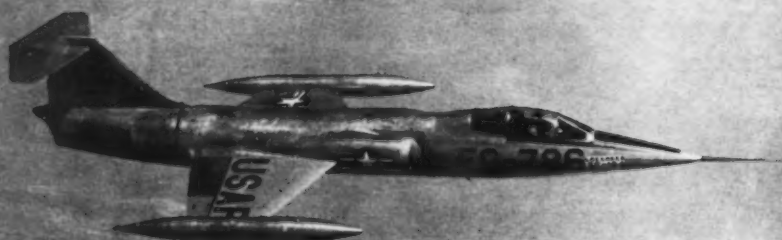
Flight refueling nose probe is fitted to Valiant B.K. Mark I bombers currently coming off Vickers-Armstrongs' production line. The airplanes are now painted in anti-radiation white and this photograph reveals that a row of nine vortex generators have been fitted outboard of each wing fence.







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**F-104 STARFIGHTER—WORLD'S FASTEST JET FIGHTER—  
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Originally developed for the U.S. Air Force as a day/night air superiority fighter, the Lockheed F-104 *Starfighter* is about to become operational with the Air Defense Command—and soon thereafter with the Tactical Air Command.

An exciting aircraft to fly, the F-104 flashes through the sound-barrier routinely, without a tremor—and possesses a

responsiveness and stability unmatched by many planes of less spectacular speed.

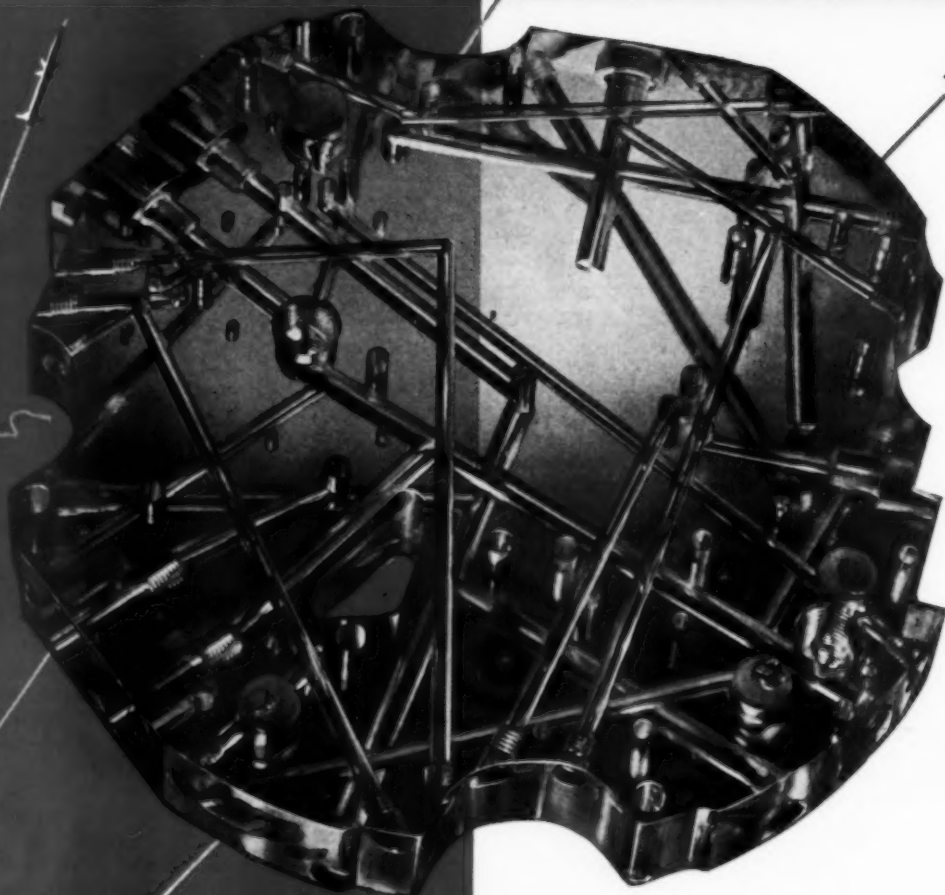
In ease-of-maintenance, too, the F-104 is outstanding. Its unique basic design incorporates many advanced features that reduce on-the-ground time and costs—thus adding extra hours of vital flying time for the *Starfighter* to defend our nation against attack by any aggressor.

*Look to Lockheed for Jet Leadership, too*

**LOCKHEED** Aircraft Corporation, Burbank, California

DECEMBER 3, 1956

# Making it complex... for simplicity!

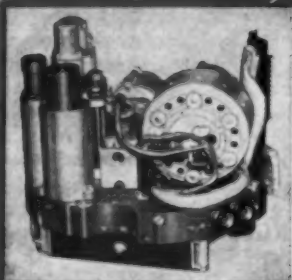


This is a transparent model of the magnesium manifolded mounting base for the Convair Terrier Missile hydraulic unit. Note the maze of drilled passages which make for a compact, reliable missile system package. All external interconnected plumbing lines have been eliminated. Components can be readily removed for servicing; the entire system can be tested as a unit and installed in a minimum of time.

The Bendix-Pacific system illustrated at the left uses compressed air to deliver electrical power for the missile, wing actuation through integral servo valves and cylinders, and hydraulic power for the remotely located roll actuator. Eighteen components are mounted on this manifold and interconnected with fifteen feet of "integral plumbing"—a complex production problem with simplicity as the end result.

Bendix-Pacific is equally as proud of its ability to conceive and design as it is of its ability to produce this type of product in volume.

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The Terrier Package, designed for Convair and in production at Bendix-Pacific, includes air motors, solenoids, hydraulic pump, servo valves, flow limiting valves, air regulators, accumulator, reservoir, solenoid, cylinders and potentiometers.



Production of components and systems at Bendix-Pacific includes rigorous and thorough testing with specialized equipment. Pictured here is the Terrier Package final assembly shake stand and associated checkout equipment.



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# What Pilots Want When Jet Age Comes

By CHARLES SCHAEFFER

When the big jet transports start flying, pilots at the controls hope to be cruising under the protection of jet-era contracts. A hint of things to come in the field of labor negotiations was contained in a jet-study report delivered at the recent Air Line Pilots Association's 14th biennial convention in Chicago.

ALPA is viewing the jet and turbo-prop age as a "new era in transportation." It will seek streamlined labor agreements to match. Whether final contracts emerge as radically different than today's piston-driven agreements remains to be seen. Right now, however, pilots see the need for some basic changes.

One—the addition of a third pilot aboard jets and turboprops—is destined to spark debate. ALPA's special Turbo-prop and Jet Study committee recommended such a policy to some 400 delegates. The report with its numerous detailed jet-age proposals was described as a "guide" rather than an "ironclad" policy.

• The ALPA committee, nevertheless stressed the need for a third pilot-trained crew member. Individual spokesmen voiced no objection to the idea of training flight engineers as pilots to make them eligible crew members. They also concurred on committee suggestions that the job rights of non-pilot crew members should be protected.

"No attempt," said the committee, "should be made to replace presently employed mechanic third crew members on reciprocating engine aircraft. We should continue to press for new third crew members on this equipment to be pilot trained and qualified." This has been ALPA's policy since 1954.

The committee cited the growing complexity of turboprops and jets. "Upon careful study, this conclusion is inescapable: in the interest of safety, a three-pilot crew is a mandatory requirement for the operation of these new aircraft."

In a tour of the Lockheed, Boeing and Douglas plants, the committee said it had seen little evidence of the need for a mechanic aboard turbine aircraft. It observed:

• That there are no propeller or mixture controls, thereby relegating the fuel cruise control to the pilot. (The complications of piston-engine cruise control involving a choice of manifold pressure, propeller RPM, mixture settings and percentage leanings, cowl flap position and engine analyzer monitoring are conspicuous by their complete absence.)

• That the vital instruments that must be monitored are located on the pilots' instrument panel.

• That compared to the Boeing 377 and Constellation aircraft, there are very few items and switches on the third crew member panel.

Along with the third-pilot proposal, the committee urged the use of Captain, First Officer, Second Officer, etc., rather than any other terms.

Possible health demands imposed by jets occupied the committee's attention, particularly the area of rapid decompression. "It has been found from experience in flying jets, the startling effect of, and the fear occasioned by, an explosive decompression, has a confusing and disorganizing effect on human beings which slows down his reaction time," the report said.

The report observed that one manufacturer requires its pilots to undergo controlled rapid decompression in a pressure chamber. Consequently, the committee recommended that ALPA launch a study on the need of pressure training and the proper use of oxygen at jet-flight altitudes.

On the subject of pilot's health, the committee found that "continuous operation of jet and turboprop equipment may have a long-range debilitating effect . . .". Suspicious factors, the report said, include oxygen poisoning, cosmic ray exposure, microwave radiation exposure, visual glare and lack of humidification. The committee recommended a broad study of these potential dangers.

## Favors Fewer Flying Hours

What about the possibility of reduced flying hours? No pat answers exist here, the report asserted. Generally, the committee favored an eventual reduction. But it was not prepared to accomplish this at the pilots' expense. Flight experience should answer the question of whether a cut is justified, the committee said.

On one point the committee was emphatic: If it ever becomes necessary to reduce flying hours drastically, such a decrease should apply to all the company's aircraft—not just jets and turboprops. "We believe, therefore, that reductions in flying hours should be accomplished by the application of realistic working conditions formulas which provide for pay and credit to the pilot for services performed," the committee maintained.

Elsewhere, the report recommended:

• Retention of present increment pay structure.

• A continued policy of individual negotiations with the airline as opposed to industrywide bargaining.

• That each collective bargaining agreement contain a provision permitting pilot participation in negotiations designed to establish realistic schedules for pay and flight credit purposes.

• Opposition to efforts to make "experts" out of pilots in areas that serve no practical purpose.

• A policy of non-ratification of union agreements by the membership on the grounds that it would tie the hands of bargainers.

In another action, ALPA delegates adopted a recommendation calling for an improved air traffic control system. Significantly, ALPA seeks a system capable of singling out jet and piston-powered aircraft in the landing sequence without reduction in the landing rate.

Among other things, ALPA said, the ATC system must:

• Handle 60 landings and 60 take-offs per hour on dual runway airports and double this in the face of military emergencies.

• Create facilities for absorbing interrupted flights in safe holding positions during bad weather.

• Provide a method of feeding jets into the final landing operations from at least 20,000 feet. ♦ ♦ ♦

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# How Fly Pointed Way to New Gyroscope

Westinghouse develops vibragyro based on principle of vibrating masses instead of rotating wheels; previous experiments unsuccessful.

By HENRY P. STEIER

A principle recognized for 100 years and unsuccessfully tried a few years ago in a new type of gyroscope has again come to the forefront. This time there are good chances of its being used in a practical device.

The idea of using vibrating masses to replace conventional rotating wheels in conventional gyroscopes was re-examined by Westinghouse Electric Corp.'s research laboratories, which has produced a gyro using the principle.

Nature's precedence in the application of gyroscopic forces was investigated by an English naturalist about 30 years ago. He reported on how common crane flies and other two-winged insects use tiny weights attached to vibrating arms for flight stabilization.

• A sensory mechanism at the base of the arms on the fly's back generate signals it uses for sensing roll, yaw and pitch. The weights were called "halteres" (leaping weight). They are vibrated by muscles at about 150 cycles per second, but the rate is irregular. The fly varies it for different conditions of flight. The result is a rate not following sine wave regularity.

It was discovered that when weight is added to one arm the fly adjusts the rate to compensate for the added weight. But if one is cut off the result is uncontrolled flight and spiral instability. The fly cannot compensate for large weight differences.

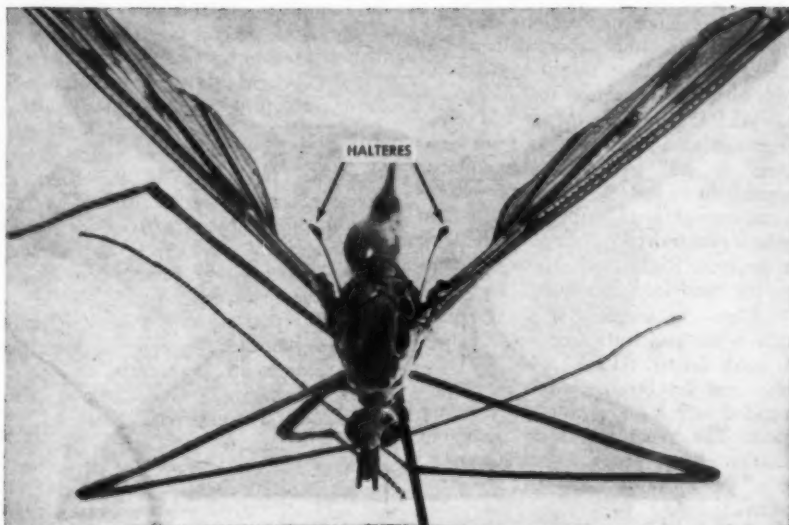
The theory about the evolution of halteres is that all insects originally had two sets of wings. Eventually one set disappeared and the halteres took their place. Apparently the extra and primary sets worked together for stabilizing flight.

## Leaping Weights Applied

About four or five years ago, the Navy sought unsuccessfully for an improved type of gyro based on use of the haltere principle. The Sperry Gyroscope Co. was reportedly the contractor for this work.

Two years ago Westinghouse went to work again on the idea to find a more rugged and reliable gyro for aircraft and missile applications. The company believes that conventional rotating gyros are approaching their peak development.

Despite previous failures it turned



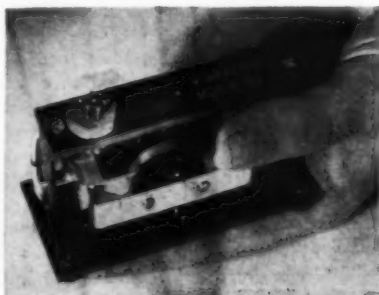
Halteres (leaping weight) used by crane fly for flight stabilization.

back to the vibrating mass principle and has come up with a vibrating rate gyro, or "vibragyro," which it says looks very promising.

• The vibragyro is inherently rugged and appears to have promise for autopilot use and some missile applications. It has no ball bearings to create "noise" in the signal output.

Ball-bearing noise has become an increasingly severe problem affecting the output signal of gyros. This has been partly attacked by floating the gimbal and wheel in fluid or using sapphire bearings.

Dr. C. S. Draper, gyro scientist at the Massachusetts Institute of Technology, is said to be pushing the use of sapphire bearings as an answer to the problem.



Close-up of vibragyro prototype. Thumb covers base-isolating mechanism to which is attributed latest success in using vibrating weights in a gyroscope.

• Up to a few months ago the Westinghouse results were not very encouraging. However, as a result of a technical breakthrough Westinghouse engineers K. A. Oplinger and George Douglas, who have been doing the work, say results are now very promising.

Oplinger recently demonstrated the principle on which the vibragyro works. A simple laboratory device that looks like a large tuning fork with weights attached to the tines was the demonstration device.

Attached to a shaft, the fork was placed in a bearing that permits the fork to rotate. Mounted at a right angle to the shaft was an arm. The arm was inserted between the coils of a spring stretched on the base holding the bearing.

• When the weights were pressed together and released they continued to vibrate back and forth. The shaft remained stationary. However, when the base was moved through an angle, the arm extending from the shaft oscillated.

The amplitude of oscillations increases in proportion to the rate at which the base is turned. This effect follows the law of conservation of angular momentum.

But for the spring damper, when the base is rotated the arm on the shaft would turn in the opposite direction to the direction of base turn. The spring

## 35 ton bomber gets carrier shakedown

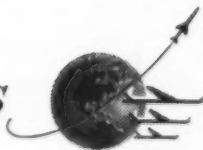
Largest and most powerful aircraft ever to operate from a carrier deck, the Douglas A3D Skywarrior has now completed landing and takeoff tests aboard the U. S. S. Forrestal—the Navy's mightiest carrier. Able to deliver the A-bomb, at speeds above 600 mph, Skywarrior is designed to extend our carrier's striking range beyond any point yet reached.



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however, pulls it back, so that the oscillating movement is derived. This movement has use as a signal generator in the actual Vibr gyro.

• **Other experimenters** failed with the Vibr gyro because of coupling between the gyro mechanism and the base to which it was attached. Secret of Westinghouse success, Oplinger says, is in the way it has isolated its gyro mechanism from the base. Westinghouse declines to discuss the new isolation technique.

Previous vibr gyros, according to Westinghouse, were sensitive to external vibrations and other unwanted signals that were fed back to the signal pick-off

Four models of the Westinghouse vibr gyro have been built. The most recent model is felt to be ready for some applications. The evaluation job has been handed to Westinghouse's Air Arm Division for tests in an autopilot it is making. Tests have already been run in a Lockheed F-94 interceptor.

#### Improvements Noted

Rate sensitivity of the vibr gyro starts with a threshold of 0.05 degrees per second and maximum rate is a high 200-300 degrees per second. The threshold sensitivity does not put it in the super-sensitive class. However, Oplinger said his company is not looking for super-precision at this time but rather a rugged, reliable and low-cost design.

He believes, though, that results obtained thus far can be applied to more critical needs found in missiles.

Weights in the vibr gyro are vibrated by an electromagnet. Amplitude of the stroke is 0.001 inch. It takes less than one watt from a 400-cycle power source to operate. Frequency regulation needed is only 0.25 to 0.5%. This is not a precise requirement by usual standards.

Wheel-type gyros need power of 10-50 watts and about 0.1% regulation for operation. They also take from seconds to minutes to come up to speed. Warmup time on the vibr gyro is nil.

• **Acceleration and vibration effects** are often serious with ordinary gyros. The vibr gyro has a natural frequency of 56 cycles per second. This is advantageous compared to usual values of 8-10 cycles in many rate gyros.

Signal pick-off from the new gyro is through a vacuum tube-type transducer made by the Radio Corp. of America. It is one developed as a phonograph pickup transducer.

This type pick-off reportedly does not satisfy engineers at the Air Arm Division. They have another design of capacitor-type in mind for the vibr gyro.



Laboratory model of halteres in foreground demonstrates vibratory motion that substitutes for usual rotating gyroscopic wheel. Pointer fastened to fork's shaft begins vibrating when base is turned through an angle. Westinghouse engineer K. A. Oplinger holds prototype of a "vibr gyro" that uses haltere principle for autopilots.

The type of signal output from the vibr gyro is advantageous because of the reduced complexity of auxiliary equipment it permits. The signal is an alternating voltage that can be directly amplified. Ordinary gyros use a potentiometer pickoff requiring dc centering devices.

The vibr gyro is easy to make. Exact machining is not needed. Assembly is simplified by its freedom from

the necessity of high-cost test and adjustment procedures.

The cost is estimated to be about one-fifth that of ordinary wheel-type gyros. There is relative freedom from temperature effects. This eliminates the need for expensive and complex temperature compensating mechanisms.

Long life is expected from the new design, since bearings are not a critical item in the vibr gyro's operation. ♦♦♦

#### Electronotes

• **Air Force and Navy** may have agreed on a "common" data link. Radio Corp. of America has announced receipt of a "large contract" to develop an air-ground data transmission system for "application to air defense, air traffic control and weapons systems."

• **New Systems engineering firm** named Granger Associates will develop and manufacture electronics gear. First work will be on new types of radio and radar systems for airlines and military. Dr. John V. N. Granger, formerly head of Stanford Research Institute's Radio System Lab., is president of Granger Associates.

• **General Electric Co.** will establish its Computer Department headquarters in Phoenix, Ariz. Computers for military, business and industrial use will be developed there. Plans call for no "giant computer" types, but systems tailored for specific requirements.

• **Sylvania Electric Products, Inc.** has announced it is supplying "passive defense system" of the B-58. Despite use of the term "passive," the equipment is believed to be countermeasure radar jamming equipment.

• **Hoffman Laboratories, Inc.** has been awarded a \$22 million contract to produce 6,001 units of the ARN-21 Tacan airborne nav-aid system. Contract was awarded by Navy's BuAer.



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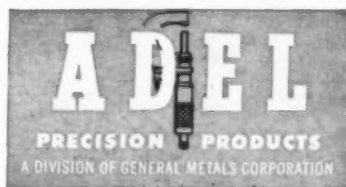
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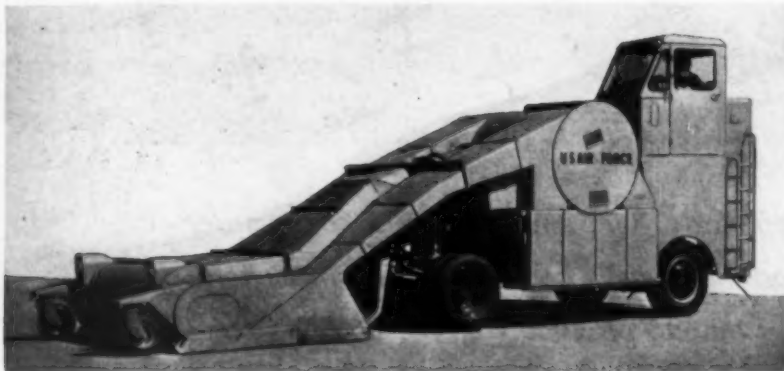
Capital Airlines • Trans-Canada Air Lines • British European Airways • Air France • Aer Lingus • Trans-Australia Airlines • Canadian Department of Transport • British West Indian Airways • Hunting-Clan Air Transport • Butler Air Transport • Iraqi Airways • Indian Airlines • Fred Olsen Airtransport • Misair • Braathens S.A.F.E. • Central African Airways • Línea Aeropostal Venezolana • Pakistan Government • Hong Kong Airways • Union of Burma Airways • Iran Government • Indian Government • Compañía Cubana de Aviación • British Overseas Airways Corporation • Philippine Air Lines • Brazilian Government • Lloyd Aéreo Colombiano • Pluna of Uruguay • Hughes Tool Company • United States Steel Corporation • Standard Oil (California) • K.L.M. • Transair Ltd. • Continental Airlines • New Zealand National Airways • Middle East Airlines • South African Airways • Pakistan International Airways • Lufthansa

\*As of October, 1956



# New Products and Processes

## GIANT SWEEPERS TO CLEAR JET RUNWAYS



Coleman Engineering Co.'s airfield vacuum cleaner.

Tremendous air pressures created by jet aircraft on takeoff suck rocks, nuts, bolts, clods of earth and all kinds of debris into their engines and cost U.S. taxpayers an estimated \$25 million in damage yearly, according to the Air Force. To combat this situation, giant vacuum cleaners or runway sweepers have been developed by two American companies and one German firm.

One of these sweepers, said to generate a force six times greater than hurricane velocity, was designed by the Wayne Manufacturing Co. under a \$100,000 AF research and development contract. Weighing 25 tons, the sweeper sucks up objects as large as 3" steel cylinders while moving down runways at 25 mph.

• Another sweeper, developed by Coleman Engineering Co., Inc., was also designed at the request of the Air Research and Development Command. Called the Cole-Vac, to differentiate it from brush-type sweepers, it operates at the normal cruising speed of an auto on a city street. The rear engine drive machine has two engines, one to propel it and the other to power the vacuum system.

The operator, seated in a cab high

at the rear, keeps in touch with airfield control towers by means of a two-way-radio. Nozzle intakes slope forward and downward from the drum-like separator, from which debris is deposited in dual hoppers.

A "pass-marker" attachment marks the path the cleaner has cleared, to avoid overlapping duplication on the return swath and to prevent skipping areas of runway, ramp or taxiway. Nozzle, hoppers, engines and cab are mounted on a standard commercial truck chassis. Power brakes, power steering and automatic gear transmission are used.

To permit rear-wheel steering and give the vehicle a shorter turning radius, the regular chassis was reversed.

• Key to the operation of the Wayne sweeper is a 10-foot nozzle similar in shape to that of a home vacuum cleaner, but generating 2,000 times greater suction power. Wind velocity at the nozzle intake is said to reach 500 mph. This suction action creates energy sufficient to pick up objects as large as steel cylinders an inch in diameter and as heavy as one pound.

Power in the Wayne sweeper is generated by a 32-blade, two-stage

blower, 39" in diameter. Weighing 4,650 lbs., it is spun at 3,400 rpm by a 12-cylinder V-type engine producing 610 hp.

Only minute dust particles are drawn through the blower blades, thus affording protection from abrasion. An 8-ft.-sq. bank of 132 vane-type centrifugal filters retains the heavier particles in the plenum chamber, where they sink into the hopper with the larger objects.

Both the Wayne and the Coleman sweepers are to be transported to Wright Air Development Center at Wright-Patterson AFB, Dayton, O. for further testing.

• A German-built runway sweeper that is said to generate suction like a tornado has been tested and is being used by Lockheed Aircraft Corp. at Marietta, Ga.

The sweeper is built by Schorling Truck Co., Hanover, Germany, H. W. Oliver Co. of Atlanta holds sales and manufacturing rights for the western hemisphere.

### Six-Ton Unit

The six-ton unit is powered by a Daimler-Benz diesel engine. Its overall length is 24½ ft. Lockheed is using it to sweep more than 100 acres of paved ramps and outside working areas. Not only is the sweeper expected to virtually eliminate the danger of runway litter, but it is also expected to retrieve a sizeable amount of small parts, lost tools and salvageable scrap.

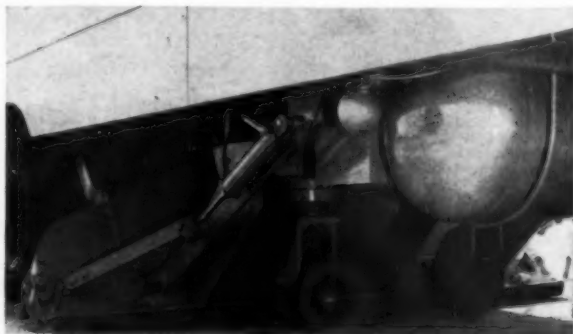
The engine has a lateral power takeoff from the transmission which operates the sweepers and suction cleaner. A special exhaustor driven by the engine produces a vacuum in the dirt chamber. This is transmitted as a suction force through flexible hoses to the suction hood over the sweeping brushes.

The brushes do not sweep in the usual sense. They agitate the surface air, creating an upward centrifugal force. When this is combined with the vacuum, a tornado effect is created.

(More New Products on pages 48 through 56)



Wayne Manufacturing Co.'s vacuum sweeper.





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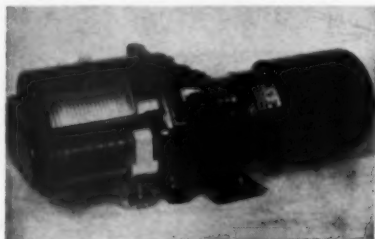
**SOLAR**  
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### HELICOPTER HOIST

Western Gear Corp. has developed for helicopter cargo and rescue work a hoist electrically operated by a 26-volt dc system, normally furnished with 100 ft. of  $\frac{1}{8}$ " stainless steel cable and a down limit switch.



Maximum rated load is 400 lbs., instantaneous load 800 lbs. Spooling capacity is 91 ft./min. up and 98 ft./min. down. Total weight, including motor, is 33 lbs. Motor does not normally carry a radio noise filter, but one can be provided if desired.

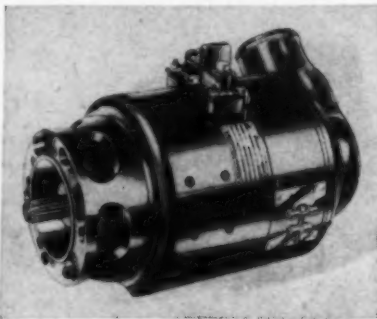
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### 450-AMP. DC GENERATOR

What is described as the highest-rated generator that has been designed for commercial aircraft is offered by Jack & Heintz, Inc.

The G23-5 is designed for mounting on reciprocating engines such as the Curtiss-Wright R3350 series and

the Pratt & Whitney R2800 series. The manufacturer says it should aid airlines in expansion of electric systems by providing a simple and economical means of effecting power increases.



The generator has a rating of 450 amps. continuous duty dc voltage of 30 and weighs 67 lbs. Its overall dimensions are 13 31/32" in length and 8" in diameter.

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### TEST PROGRAMMER

Dit-Mco, Inc. has developed a multiplier section designated Model 850, for use with the Dit-Mco Model 200 circuit analyzer. The multiplier is a plug-board device that permits desired circuitry connections to be made with phone-jack type patchcords.

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### TWO-ELEMENT OIL PUMP

A two-element oil pump developed by Lear-Romec Div., Lear Inc. has a mounting pad and drive for a high-pressure hydraulic pump. The lube element feeds oil to gas turbine engine bearings, while the hydraulic element supercharges the hydraulic pump.



The pump, designated Model RG-15290, is the positive displacement, rotary vane type. Both elements have built-in check valves to prevent a reverse flow. Hydraulic element incorporates a pressure relief valve.

Capacity at 3,750 rpm, 60 psi gauge discharge pressure with MIL-L-7808 fluid at 176°C (350°F). Lube element: 8.4 gpm; hydraulic element: 3.7 gpm. Displacement of lube element is .620 cu. in. per rev., hydraulic element .316 cu. in. per rev.

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### Aircrafts' Who's Who Reports

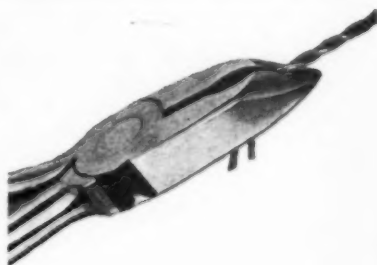
A cross section of the Who's Who in the aircraft industry—including Douglas, Allison, Fairchild, Grumman, Martin, Republic, Canadair Ltd., Pratt and Whitney among a host of others — is reported to have reduced engine wiring time as much as 66%. This saving is effected by the use of the new Robinson Wire Twister, an improved model of the ones that have seen service with the army, navy and airforce since 1943. Improvements include the exclusive diagonal jaw design that permits easier access to hard-to-reach areas, and clamps a vice like grip on the wire by pulling it into a 30° bend thus delivering added leverage for twisting.

In addition to the greatly increased engine wiring speed, users attest to improved shop safety — fewer skinned knuckles and bruised fingers.

Besides their production line assignments, Robinson Wire Twisters readily adapt in the shop to bench work, on radio and radar equipment, on magnetos, carburetors, instruments and sub-assembly work of all kinds.

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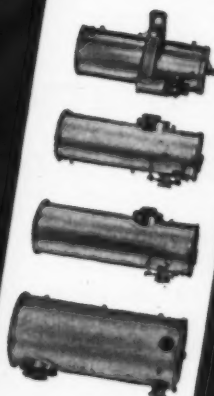


Janitrol standard couplings for compressor air ductwork save up to 40% in weight.



Janitrol hot fuel prime units help engines start in seconds and run free in minutes, from -65°F.

Janitrol pneumatic control valves for critical high pressure applications combine functions, save weight and space.



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Commander R. W. "Duke" Windsor poses with the record-breaking F8U-1 "Crusader" immediately after his 32-minute jaunt. Plane flew more than 400 miles—all but eighty of them at supersonic speed.

## Purolator Micronic® filters help set 1015.428 mph speed mark

On August 21, this Navy Chance Vought F8U-1 "Crusader" set a new national speed record of 1015.428 miles an hour and won the famous Thompson Trophy. The plane, a standard production model, made two passes over the 15.1 kilometer course—both of them at speeds nearly 200 miles faster than the previous Thompson record.

This record flight put every component in the F8U-1 to its severest test. For, at 1000 mph, every component must function perfectly—whether it's the powerful J-57-P4 engine, the instrumentation, or the vital fuel, lubrication and hydraulic lines.

Effective filtration is essential on this F8U-1—as it has been on all aircraft for the past twenty-five years. Purolator Micronic filters ensure that fluids move freely, and give optimum performance, by filtering out sub-micronic particles of foreign mate-

rials which could cause serious trouble in a plane flying at record-breaking speed.

There are Purolator filters for aircraft oil, fuel, hydraulic fluid, air and gas systems—for both standard and special applications.

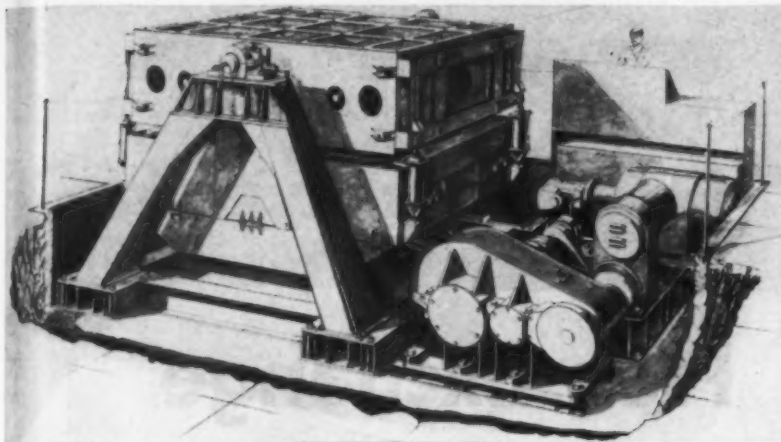
All of them are the products of continuing research and improvement, designed and made to meet the most stringent requirements. For more information on Purolator Aviation Filters, write today to Dept. P5-102.

*Filtration For Every Known Fluid*

**PUROLATOR**  
PRODUCTS, INC.

Rahway, New Jersey and Toronto, Ontario, Canada

## SLOSH & VIBRATION TABLE



Century Engineers, Inc. has completed preliminary design of a 20,000-lb. capacity slosh and vibration table for Wright Air Development Center to be used for environmental testing of aircraft fuel cells and tanks.

The test device features an 8-ft. wide and 10-ft. long platform supported on four air cylinders that isolate vibrations from the reaction block.

Circle No. 121 on Reader Service Card.

Vibration driving force is produced by four eccentric mass force generators each rated for a peak force of 60,000 lbs.

For vibration tests the unit will operate over a 20-to 50-cps range and handle specimens weighing from zero to 20,000 lbs. Slosh frequencies for such test items can be varied from 0 to 20 cpm.

## WIRE MESH FILTER

A rigid wire mesh filter medium has been developed by Aircraft Porous Media, Inc. for use in its line of aircraft hydraulic system filters.

Called Rigimesh, the filter is made by furnace-welding the wires of the mesh at all contact points. It has plate-like characteristics that permit fabrication by cutting, rolling, corrugating and welding without loss of the original uniformity of mesh openings.

Filter elements of Rigimesh are reusable and are strong, light in weight and resistant to extreme temperatures and corrosion. Filters operating with these elements at temperatures from -65°F to 900°F, for pressures from vacuum to 10,000 psi service, have particle size retention ratings of 2 to 2,000 microns.

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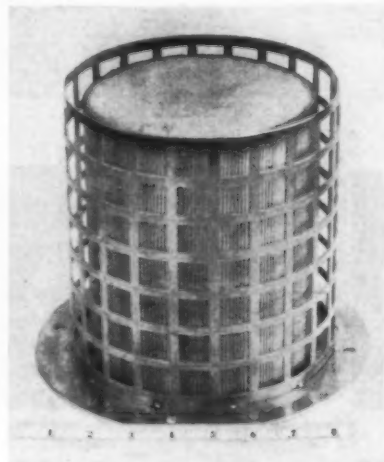
## COPTER LUBRICANT

Shell Oil Co. has developed a lubricant for helicopters, designated Aero-shell No. 14, specially designed for main rotor and tail rotor bearing assemblies.

The grease is said to minimize fretting corrosion and to prevent corrosion of bearings due to moisture. It flows well at low temperatures, as low as -65°F. It is also said to permit longer periods between lubrication.

Shell says Aero-shell No. 14 has been recommended by Sikorsky Aircraft for use in all its copters.

Circle No. 123 on Reader Service Card.



Circle No. 114 on Reader Service Card.

## AUTOMATION CONTROL

Airborne Instruments Laboratory has developed electronic gauging and control equipment designed to permit automatic control of machine tools in use by large and small manufacturers.

Designed on a "building-block" basis, the units provide manufacturers with basic components with which to build automation into their operations on a function-by-function basis. Trade-named MICRO-trol, the units are packaged. The line includes three types of gauge heads, five dimension indicating units and optional accessories for adapting the units to different applications.

Circle No. 124 on Reader Service Card.

## UHF TUBES

Two new UHF transmitting tubes weighing two ounces each have been announced by the Radio Corp. of America. The tubes have a CW useful power output of 80 watts at 400 mc and 40 watts at 1,200 mc.

The tubes were designed for communications equipment. Type 6816 has a 6.3-volt, 2.1-ampere heater; the 6884 a 26.5-volt, 0.52-ampere heater. A co-axial electrode structure is used with ring-type ceramic metal seals. Diameter of the tubes is 1 1/4" and length 1 1/8".

Circle No. 125 on Reader Service Card.

## DIRECT-WRITING OSCILLOGRAPH

Minneapolis-Honeywell Regulator Co. Heiland Div. has introduced an instantly-readable dynamic recording oscillograph. Called new Visicorder, it records frequencies to 2,000 cps, using galvanometers without need for "peaked" amplifiers or other compensation.

The oscillograph has six channels that are recorded on a six-inch chart. Deflection is 6" peak-to-peak. Chart speeds are 0.2", 1", 5" and 25" per second, minute or hour. One hundred feet of record can be carried and loaded in daylight. Weight is 45 lbs. The unit measures 10 x 14 x 10 inches.

Circle No. 126 on Reader Service Card.

WORLD'S PREMIER AIRPLANE FABRIC

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stronger

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Leading Manufacturers of

Fabric and Tapes for the

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Circle No. 20 on Reader Service Card.





# Free Exchange of Ignition Experience



Photo at far left shows a typical conference scene as an airlines representative takes the microphone to ask a question. At right, Richard Teasel, Champion's Director of Research (with microphone) speaks for Champion.



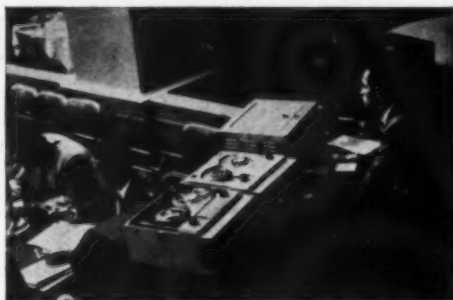
Champion's R. K. Christie (left), Vice President for Engineering and Research, and Larry Lentz (center), discuss series of special reports that noted aviation expert and writer Herbert O. Fisher (right) will do for the Champion Spark Plug Co.



87 different organizations from nine nations were represented at the three-day conference, the twelfth annual ignition meeting sponsored by Champion.



Even during the midmorning and midafternoon refreshment breaks, the conversation was shop talk as the participants made the most of this unusual opportunity to exchange ideas and experiences.



Two tape recorders transcribed the questions and answers into a complete report containing a wealth of ignition information that can help solve your ignition problems.

# Benefits Every Area of Aviation

## ORGANIZATIONS REPRESENTED

Aeronaves de Mexico  
Air Associates, Inc., Chicago  
Air-France  
Air Transport Association  
Allegheny Airlines  
Allison Division—GMC  
American Airlines  
American Aviation  
American Bosch  
AP Parts Company  
Bristol Aero Engines  
Canadian Pacific  
Canadian Pratt & Whitney  
Capital Airlines  
Champion Spark Plug Company  
Champion Spark Plug Company,  
Canada  
CIA Mexicana de Aviacion  
Co-Operative Industries  
Continental Airlines  
Continental Engineering  
Delta Airlines  
DuPont  
Durham Aircraft  
Eastern Airlines  
Esso Research  
Esso Standard Oil  
Ethyl Corporation  
"Flying" Magazine  
Flying Tiger Lines  
Frontier Airlines  
Ford Motor Company  
Ford Motor Company, AED  
General Aircraft—Detroit  
General Laboratory Assoc.  
Gulf Oil Corporation—  
Pittsburgh

## Sponsored by Champion Spark Plug Company, Toledo conference brings together outstanding ignition experts from 9 nations

For three days in October a group of aviation authorities, representing one of the greatest concentrations of aircraft ignition knowledge and experience ever assembled, met in Toledo and freely exchanged hard-won technical information.

This was the 1956 Aircraft Spark Plug and Ignition Conference, sponsored by the Champion Spark Plug Company to provide a forum for the interchange of

information on all phases of aircraft ignition—for the benefit of everyone in aviation.

The sessions were recorded word for word, and a complete transcript of every question and answer will soon reach Champion representatives and distributors. If you have an ignition problem, chances are they have the solution.

Why not ask them?

Hallett Mfg. Company  
Imperial Oil Company  
Imperial Oil Company, Ltd.  
"Interavia"  
KLM  
Lake Central Airlines  
LaDriere Studio  
Lockheed Aircraft Corp.  
Lockheed Aircraft Service  
Mohawk Airlines  
National Airlines—Miami  
North Central Airlines  
Northeast Airlines  
Northwest Airlines  
Orenda Engines  
Ozark Airlines  
Packard Electric  
Pan American Airways  
Phillips Petroleum Company

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Port of New York Authority  
Pratt & Whitney Aircraft  
Royal Canadian Air Force  
(RCAF)—Ottawa  
Royal Canadian Navy  
Scandinavian Airlines System (SAS)  
Scintilla Div. of Bendix  
Scott Aviation Corporation  
Sensenich Corporation  
Shell Oil Company  
Shell Oil Company—  
Wood River Research  
Sidney F. Mashbir Company  
Sinclair Research  
Socony Oil Company  
South African Airways  
Southern Airways  
Sperry Gyroscope  
Standard Aircraft Equip., Inc.

Standard Oil Company of Ohio  
Standard Products  
Texas Company  
Trans Canada Airlines  
Trans World Airlines  
United Air Lines—San Francisco  
Vapor Blast Mfg. Co.  
Westinghouse  
Wright Aero. Div. of Curtis Wright  
and  
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Army Ordnance Corps, the  
U.S. Marine Corps, the U.S.  
Navy Bureau of Aeronautics,  
the U.S. Air Force, the Civil  
Aeronautics Bureau, and the  
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SPARK PLUGS

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

DECEMBER 3, 1956

Circle No. 21 on Reader Service Card.

53

Is your Jet Engine RPM Measurement Accurate???

The NEW B&H Instrument

# TAKCAL

- COMPACT
- LIGHT
- RUGGED

For Turbo-Jet  
or Prop-Jet



... Reads Jet Engine Speed to Guaranteed Accuracy of 10 RPM in 10,000 RPM ( $\pm 0.1\%$ )

Checks  
Tachometer  
System  
—  
Adapts  
to any  
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Problem

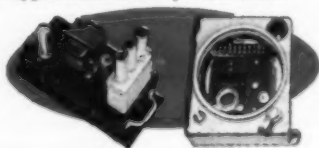
The inter-relation of RPM to efficiency and thrust in jet engines is fundamental. Proper adjustments for maximum thrust, engine life and safety of operation can be made only upon accuracy of instrumentation.

The new B&H TAKCAL incorporates a refinement of the frequency meter principle. It operates in the low (0 to 1000 cps) range, reading the frequency of the tachometer generator on a scale calibrated in percent RPM corresponding to the engine's RPM. In addition, the TAKCAL checks the tach system. The TAKCAL circuit and tachometer are parallel so that readings can be made simultaneously to determine the accuracy (or inaccuracy) of the aircraft's tach system. The TAKCAL operates during the engine run to properly set up engine controls for maximum economy and safety.

The TAKCAL's component parts are identical with those used in the J-Model JETCAL Analyzer. They are here assembled as a separate unit tester and for use with all earlier models of the JETCAL Tester.

The TAKCAL operates accurately in all ambient temperatures from  $-40^{\circ}\text{F}$ . to  $140^{\circ}\text{F}$ . Low in cost for an instrument of such extreme accuracy, it is adaptable to application in many other fields.

Explosion-proof TAKCAL for special applications. Measures 200 to 7500 RPM, direct reading, with  $\pm 0.1\%$  accuracy.



For full information write or wire

**B & H INSTRUMENT CO., INC.**

3479 West Vickery Blvd., Fort Worth 7, Texas

Circle No. 22 on Reader Service Card.

## INSTRUMENT VALVE

An instrument valve for accurate control of gases or liquids, featuring positive shut-off, "O"-Ring seals and plastic self-extracting seat is offered by Robbins Aviation.



The valve operates from high-vacuum to 3,000 psi with fingertip control at all pressures. There is no surge of gas or liquid when the valve is opened. Operates at temperatures ranging from  $-100^{\circ}\text{F}$  to  $500^{\circ}\text{F}$ . User should specify type of gas or liquid and temperature.

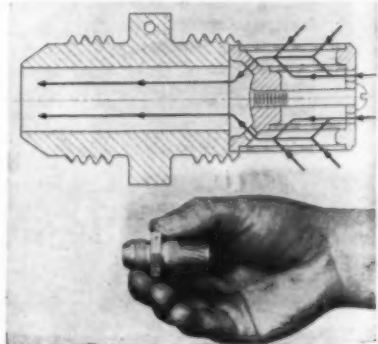
Two models are available, No. INSG125, with  $\frac{1}{8}''$  ports, weighing  $6\frac{3}{4}$  oz., and No. INSG250, with  $\frac{1}{4}''$  ports, weighing  $6\frac{1}{4}$  oz.

Circle No. 119 on Reader Service Card.

## UNION-FILTER

Purolator Products, Inc. has developed a two-way union-filter to protect aircraft hydraulic system valves and other precision components.

The unit consists of two frameless wire-wound filter elements welded to a union and can handle a flow of hydraulic fluid in either direction.



Filter unit consists of nested elements which are said to provide more filtering area and to reduce pressure losses more efficiently than would be true with a single element. It will catch all particles down to .003" in size, according to the manufacturer.

Unions are available in aluminum, stainless or plated steel, and can be made in all AN sizes for standard aircraft practice.

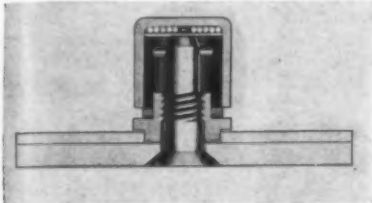
Circle No. 120 on Reader Service Card.

AMERICAN AVIATION



## STRESS PANEL FASTENER

Pastushin Industries, Inc. is manufacturing a stress panel fastener to meet increasing requirements for an easily operable mechanism to carry critical stress panel loads. The company says it will fasten and unfasten an airplane's access doors faster and easier than any other device of its kind.



The fastener consists of six steel and alloy parts: stud, nut, clip, retainer, washer and spring. Full-shear strength equal to NAS-547 spec and/or NAS 334-335 close tolerance bolt. When released the stud automatically ejects from the retainer, permitting the panel to be removed without forcing or prying. A data catalog is available.

Circle No. 127 on Reader Service Card.

## WATER PURIFIER

A water purifier offered by the Tested Appliance Co. is said to have a filter system that not only eliminates dirt and suspended materials but also completely removes all tastes (as from



chlorine) and odors.

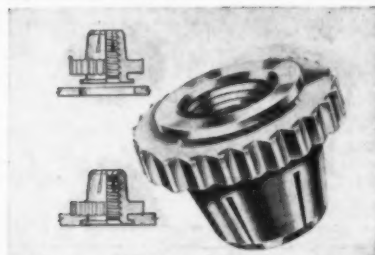
Trade-named the Everpure Model S1, the unit provides pure water for all purposes. It measures 7½" high by 4" in diameter and weighs less than 2½ lbs.

Service is needed only when the flow becomes slow which, according to the manufacturer, means only once or twice a year under normal conditions.

Circle No. 128 on Reader Service Card.

## SHEET METAL FASTENER

A sheet metal fastener offered by Rosán Inc. is designed so that it is locked into the parent sheet both radially and axially. Called the Rosán Press-Nut, the fastener is available in thread sizes from 2 to 10.



Flush mounting may be obtained with sheet thickness as small as .035". A self-locking feature in Press-Nuts made of 303 stainless steel is designed to meet government specs AN-N-5 and AN-N-10, covering self-locking nuts. Also available without the self-locking feature.

Circle No. 129 on Reader Service Card.

## SHAPING FIXTURE

A new tool developed by Martin Co. engineers simplifies shaping of "orange peel" type skin details. In the inertial nose of the Air Force's TM-61 Matador missile, contoured aluminum skins up to .08" thick are vacuum-



**TEDECO**  
SELF-CLOSING  
MAGNETIC  
DRAIN  
PLUGS

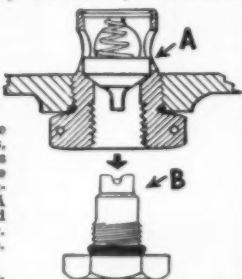
PERMIT CONVENIENT, DIRECT, VISUAL INSPECTION . . .

- WITHOUT LOSS OF FLUID
- WITHOUT SPECIAL TOOLS
- WITHOUT ELECTRIC GADGETS

Oil inspection is easy and simple with Tedeco Drain Plugs. Funnels, drain pans, electrical connections are eliminated. The automatic valve prevents loss of oil while the magnetic insert is visually inspected. A flexible drain line can be attached without removing the main plug. Complete range of sizes and types. Write for catalog.

Proven in service by leading aircraft manufacturers, airlines and the Armed Forces. • Patented

Complete line of gear case accessories.



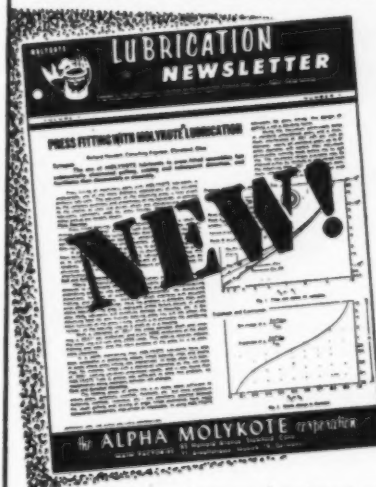
Automatic valve (A) drops into position when magnetic insert (B) is removed.

**TECHNICAL DEVELOPMENT CO.**

P. O. BOX 82 • GLENOLDEN, PA.

Circle No. 23 on Reader Service Card.

## A TECHNICAL NEWSLETTER ON LUBRICATION WITH MOLYKOTE . . .



IF YOU  
HAVEN'T  
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Every issue features a technical article on the use of MOLYKOTE Lubricants in industry • "How-to" stories on tough lubrication applications • Filled with engineering data which applies to all industries • Being published regularly.

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Circle No. 24 on Reader Service Card.

locked to the new shaping fixture and accurately trimmed to provide precise butt fittings of the skins.

The fixture is of plastic fiberglass laminate, shaped from a plaster cast conforming to the Matador's nose skin contour. Aluminum skin details are placed on the fixture and aligned with tooling pins or positioning tabs. The skin is locked in position by creating a vacuum between the skin and a network of vacuum grooves. A ring of  $\frac{1}{4}$ " rubber tubing provides the seal.

Pressure is applied and held constant by means of a Marvac venturi unit.

Circle No. 130 on Reader Service Card.

#### LUBRICANT TEST MACHINE

Alpha Molykote Corp. Testing Machine Division has developed a lubricant test machine that is said to give a direct and accurate indication of frictional forces up to 100 psi in one-psi units.

The Model LFW-1 tester uses a stationary rectangular test block that is pressed with a predetermined load (up to 630 lbs. maximum) against a rotating Timken ring. Resulting friction is indicated throughout a test by a dial indicator as a counter records the number of revolutions of the test specimen.

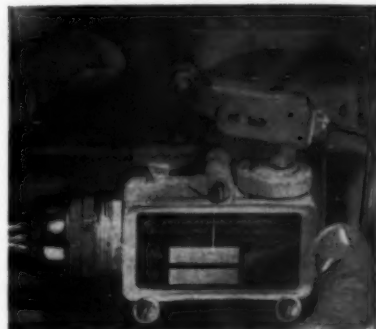
The test device is powered by a  $\frac{1}{4}$ -hp. motor and operates from 115-

volt, 60-cycle, single phase current. It weighs 130 lbs. and measures 23" x 20" x 20".

Circle No. 118 on Reader Service Card.

#### AIRCRAFT CONTROL SWITCH

Electro-Snap Switch and Mfg. Co. offers a new switch with an adjustable acuator that permits faster installations and better operational accuracy. Adjustment through 14 degrees is provided.



The H1-43 switch has standard three-hole mounting and is a replacement for MS 23040 switches. The switch mechanism is sealed in inert gas and is rated at 10 amperes, 125/250 v-ac, 28 v-dc.

Circle No. 131 on Reader Service Card.

#### HIGH-ALTITUDE SUIT

A new type of high-altitude suit developed for the Navy Bureau of Aeronautics by the Arrowhead Rubber Co. permits the wearer to sit, stand and walk with freedom. Company engineers call it "Gus"—for "Garment, Upper Stratosphere."



Said to be the lightest high-altitude suit made, it was parachute-jumped in a free fall from a moving aircraft. It floats. Specially designed shoulder and upper arm bellows have been substituted for metal bearings used on other suits.

Circle No. 113 on Reader Service Card.

## THE MODERN AIRPLANE Requires for Reliability MULTI-DIRECTIONAL Engineered Mounting Systems Combining Vibration and Shock Control



Robinson Engineered all-metal shock and vibration control systems are preferred by the aviation industry. They provide performance, reliability and life to electronic equipment in commercial airplanes, jet aircraft, guided missiles and rockets.

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through  
ENGINEERING

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TETERBORO, NEW JERSEY  
*Vibration Control Engineers*  
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Dawn-to-dark firing tests speed delivery of the mighty power plants that will thrust America's missiles into outer space.

## On the line...rocket engines for America's major missiles

Deep in the remote canyons of the Santa Susana Mountains, a bolt of flame knifes the sudden darkness of a California evening.

Obscured in the shadows — watching this man-made lightning flare and die as it has an untold number of times before — are the men of ROCKETDYNE... testing and tuning the giant propulsion systems they are building for the major missile proj-

ects of the Air Force, Army and Navy.

This amazing rocket engine workshop was planned as far back as 1947, about a year after ROCKETDYNE — in collaboration with the Armed Services — began a program of research that has led to accomplishments so fantastic, security restrictions forbid us to describe them.

The fact that this work is so far advanced here in America is cause for

sober confidence in our defense situation. It is good to know that these achievements are in the service of free men.

ENGINEERS: write for our brochure, "The Big Challenge," which tells you in detail what a career in rocketry can mean to you. Address: ROCKETDYNE, Personnel Manager, Dept. A-71, 6633 Canoga Avenue, Canoga Park, California; or Dept. A-71, Neosho, Mo.

# ROCKETDYNE

A Division of  
North American Aviation, Inc.

BUILDERS OF POWER FOR OUTER SPACE

DECEMBER 3, 1956

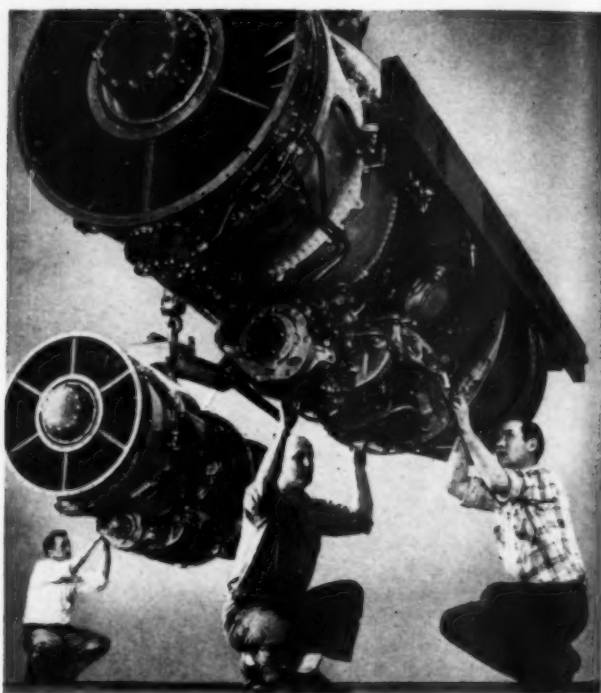
57



# How many magazines does it take



**MAGAZINE "A"** . . . tops with Airframe Manufacturers — a \$6,540,000,000 business last year. Magazine "A" rings the bell with a 12,717 airframe distribution . . . 11,125 concentrated with the 21 leading companies who accounted for 91% of the dollar volume.



**MAGAZINE "B"** . . . shines among Engine Manufacturers — a \$1,933,000,000 piece of the market last year. 95% of these sales were accounted for by the top 13 firms in the field. Magazine "B" is the clear leader here, with 3,044 of its 3,434 total engine circulation concentrated among these vital 13.



**MAGAZINE "E"** . . . sky-high with U. S. Air Carriers who accounted for a \$1,610,000,000 sales volume last year. With a 10,393 circulation, Magazine "E" is flying high in the commercial sky, consistently concentrating its coverage with the important influences at the largest companies.



**MAGAZINE "F"** . . . biggest seller in Business Flying. 1,750 corporations own and operate multi-engine, several single engine planes, or a fleet comprised of both. Magazine "F" hits home in this category, with 2,242 of its circulation going not only to the fleet operators, but to the men responsible for buying replacements, supplies . . . and additional ships.

# ke to cover the Aviation Market?



**MAGAZINE "C"** . . . clicks with Components Manufacturers of whom some 4,000 major producers did \$2,650,000,000 worth of business in 1955. Magazine "C" tops the field, with 7,034 circulation penetrating the key buying influences. That's a conservative 96% coverage of this crucial category.



**MAGAZINE "D"** . . . pinpoints the Military. Procurement is channeled through 18 procurement offices. Magazine "D" packs a potent punch with the key personnel of these offices, with a 3,834 circulation reaching the buyer-specifiers and the research and development engineers who determine the buying patterns.



**MAGAZINE "G"** . . . out front at the Terminal Airports. \$237,000,000 was spent in 1955 at the 345 terminal airports in the U. S. used by certificated trunk lines. Magazine "G" wraps up this important segment of the market, with 549 selective circulation going to local managers and other key personnel who influence buying at the point-of-purchase.

Seven magazines to sell the aviation market? No, just one . . . Magazines "A" through "G" are all the same publication . . . **AMERICAN AVIATION!** When you think about covering the aviation market, you always come up against this inescapable fact . . . it takes just one magazine, **AMERICAN AVIATION** to deliver 91% concentrated coverage of the entire aviation industry. If you would like to receive a copy of our latest fact-full market study "Concentration Where Concentration Counts", please write William H. Pearson, Adv. Dir., 17 E. 48th St., New York 17, N. Y.

## American Aviation

The International Air Transport Association ought to be worried about the increasing number of cut-price services between the U.S. and Latin America. These operations are losing IATA carriers many of their tourist passengers, for the fares offered are considerably lower than those of the "big league" airlines.

A prime example of the cut-price operations to Latin America is the service recently opened by Chilean airline CINTA between Miami and Santiago. The IATA tourist fare for this flight is \$678 round trip yet CINTA charges just \$394.20.

Down the other coast of South America REAL-Aerovias Brasil has been successfully operating cut-price services for many years. Currently it flies four round-trips weekly. The Brazilian airline charges \$432.60 for a 30-day round-trip excursion ticket from Miami to Buenos Aires. This contrasts very markedly with the IATA round-trip tourist fare of \$779.

• Some operators carrying primarily U.S. traffic do not actually have a U.S. terminal. Colombia's RAS and Chile's ALA, for example, connect with APA of Panama at Panama City and APA aircraft take the passengers on to Miami. There is an interchange arrangement between RAS and APA so passengers do not have to change aircraft.

The main disadvantage of the cut-price services is that they are usually operated with elderly equipment—DC-4s or C-46s—and consequently tend to be slower than those of IATA carriers. There are exceptions, however. TAN, the airline of Honduras, has the fastest flights from the U.S. to Honduras while LACSA not only provides the cheapest service between the U.S. and Costa Rica but operates the route with modern aircraft—Convair 340s.

REAL-Aerovias Brasil soon will also join the swing to modern equipment, substituting DC-6Bs for the presently used DC-4s. Argentina's new non-IATA carrier Transcontinental (AMERICAN AVIATION, November 5) plans to fly Super Constellations between New York and South America at low fares.

Most of the "off beat" carriers flying between the U.S. and Latin America are full-fledged airlines with excellent operating records. Their steady, unpublicized growth indicates that the traveling public has no hesitation in passing up the IATA carriers when others offer reliable low-cost transportation.

## British Airport Official Suggests Runway Extensions Be Halted

A hope that "there will soon be a halt to the business of extending runways and that there will be no extensions for expensive airplanes from overseas" was expressed by Sir John D'Albiac, commandant of London Airport, at a meeting of The Royal Aeronautical Society in London.

The Russian Tu-104, Sir John felt, "dealt fairly well" with existing runways and used very little for landing, but its takeoff seemed rather long. However, he added, the pilot may have been holding it down on takeoff.

Other pungent comments on airport problems were offered by Sir John. He hopes, for example, that GCA will be "piped into the control tower" at London Airport instead of having the operators in cramped runway trailers. He also hopes to have more computer aid for controllers, "who are rapidly approaching mental saturation." Summer maximum is 60 movements an hour, with 45 in winter under IFR conditions.

• Turning to other airport problems, Sir John said: "Perhaps the passenger is the one person who does not get a look-in; nowadays he has to do so many things he does not want to do." The "packaged" system is unpopular and, on overseas flights, he ought to be able to book his seat. "LAP has good waiting rooms with comfortable seats but the passengers queue by the doors waiting for the gun."

"The VIP," Sir John noted, "is particularly difficult to deal with, but I am afraid he has come to stay. Nobody likes him; not the airlines, the customs, the immigration, nor the airport com-

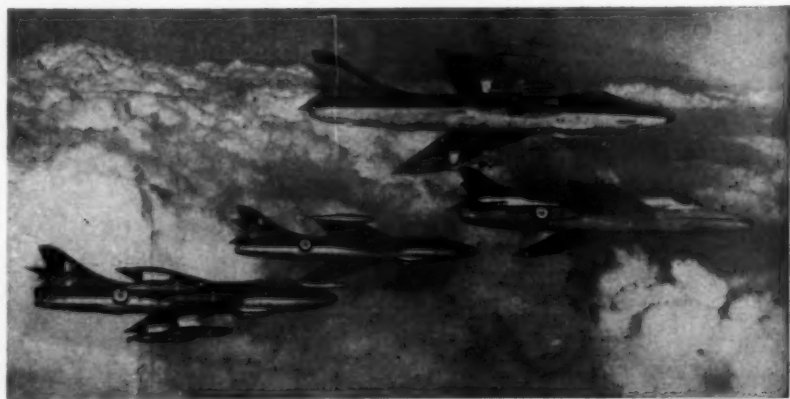
mandant!" At London Airport the main difficulties were "preventing the currency from being devalued" and spreading a strictly limited number of VIP lounges among a total of 37 airlines.

• Animal movements had become a problem until the Royal Society for the Prevention of Cruelty to Animals (RSPCA) hostel was opened in 1952, since when, excluding bees and mosquitoes, 1,614,152 living creatures had been accommodated—including 269,966 US-bound monkeys. Biggest problem for Sir John is expansion within the London Airport's central island site, particularly the parking of automobiles, and its unsuitability for passengers "fingers" to the airplanes.

Noise complaints occupy much of Sir John's time, but he indicated that more earth walls around the maintenance areas, plus strictly limited night running, should keep the ground running complaints at a low level. Present selective use of runways away from built-up areas for the noisier airplanes puts too much additional strain on the controllers. "But wait till the big jets come," warned Sir John: "the Tu-104 made a frightful row taking off."

Currently 37 international airline operators are using London Airport. Average daily aircraft movements are now 350, with passengers totalling well over 10,500. Total annual aircraft movements have risen from 9,054 in 1946, when London Airport opened, to an estimated 126,000 in the current year. Passengers have increased from 63,151 in 1946 to an estimated 3,200,000 this year.

## Four Types of Hawker Hunters



These Hawker Hunters in formation include: T7 trainer, leader; private-venture Mark 4 with Fairey Fireflash missiles, nearest; Mark 6 with fixed tip tanks, farthest; Mark 6 with four 120-gal. drop tanks, at bottom left.





**B**OEING's mighty B-52 and its new tanker sister, the KC-135, will add enormously to the Air Force's long-range power. These jet-powered giants use Hamilton Standard equipment. Years of aviation experience, the highest engineering skills and unsurpassed facilities lie behind the basic equipment produced by Hamilton Standard for turbine and piston-engined aircraft.

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Propellers • Starters • Air Conditioning Systems • Fuel Controls • Valves • Pumps  
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# **SAS**

**SCANDINAVIAN  
AIRLINES SYSTEM**

## **INAUGURATES *Global Express* SERVICE**



WRIGHT AERONAUTICAL DIVISION  
**CURTISS-WRIGHT**  
CORPORATION • WOOD-RIDGE, N. J.

*World's Finest Aircraft Engines*



## **...with TURBO COMPOUND- powered Douglas DC-7Cs**

A new era in air travel to Europe is opened up by the new DC-7C "Global Express" of SAS—Scandinavian Airlines System—a service featuring the first and only one-stop flight from Los Angeles to Europe, with other time-saving runs that include New York-Hamburg and New York-Copenhagen non-stop, and through service to leading European cities. For all these flights, including those of its famed polar route from California to the Continent, SAS chooses Douglas DC-7Cs powered by the Curtiss-Wright Turbo Compound® engine.

Today, 41 leading world airlines have selected the Turbo Compound to power the luxury flights, the blue-ribbon, coast-to-coast, continent-to-continent, and over-ocean runs where speed and comfort are the keynotes.

The fastest airliners in service today are powered by this world-famous engine that combines speed, range, dependability and operational economy. With a backlog of more than 23 billion seat miles, and with a perfect safety record, the Turbo Compound has proven its claim to leadership among the world's airline engines. The more than 53 million seat miles now flown daily behind the Turbo Compound will increase to 100 million daily as future schedules take effect.

CURTISS-WRIGHT OF CANADA, MONTREAL • CURTISS-WRIGHT EUROPA, AMSTERDAM

AMERICAN AVIATION

# People

## MANUFACTURING

**John J. Farley** appointed base administrator of Northrop Aircraft, Inc.'s Edwards AFB installation, succeeding **Robert W. Rolfe**, appointed asst. to the vp-administration. **Roland E. Owen** succeeds Farley as chief of production flight test at Palmdale.

**Frank H. Miller** elected asst. treas. of Curtiss-Wright Corp.

**D. N. Taylor** appointed sec'y-treas. and elected a director of Pastushin Aviation Corp., replacing **H. C. Waken**, resigned.

**Harry B. Horne, Jr.**, promoted to manager of contracts and spares for Vertol Aircraft Corp.

**Dale L. Dale** appointed gen. sales mgr. of Telex, Inc.'s industrial electronics div.

Four persons have been promoted to vice presidencies of Hughes Aircraft Co.: **Edward M. Boykin**, field operations; **C. Harper Brubaker**, planning and programming; **Clarence A. Shoop**, flight operations; **Roy E. Wendahl**, vp and mgr. of Tucson operations.

**Capt. Gould Hunter** (USN, ret.) named asst. to the vp-manufacturing, Eitel-McCullough, Inc.

**John E. Fasano** named sales mgr.; **Bayeux B. Morgan, Jr.**, asst. sales mgr.; **Robert H. Kane**, advertising mgr.; **J. Laurence Sutton**, mgr. of customer service, for the Heli-Coil Corp.

**Paul H. Kreager** appointed contracts mgr. of Kearfott Co.'s western div.

**L. Eugene Root** appointed vp of Lockheed Aircraft Corp. and gen. mgr. of Missile Systems Div.



MILNER



ROOT

**Warren E. Milner** named mgr. of Milwaukee plants of AC Spark Plug Div., General Motors.

**Servomechanisms, Inc.** appointments: **Warren C. Wilson**, head of advertising and public relations dept.; **Dr. Robert E. Buchele**, staff asst. to western division mgr.; **Thomas R. Cataldo**, sales mgr. of Mechrol Div.

**Charles Chester** appointed asst. mgr. of operations planning on the Boeing Airplane Co. transport div. sales staff.

**Bell Aircraft Corp.**'s weapons systems division subdivided into four units: avionics, **John H. van Lonkhuyzen**, mgr.; rockets, **William M. Smith**, mgr.; guided missiles, **Jesse H. Zabriskie**, mgr.; research, **John F. Strickler, Jr.**, mgr.

**Conrad Hohmann** appointed asst. chief engineer, special airborne devices, for Vickers Inc.

**Jeffrey Quill** appointed head of Vickers-Armstrongs (Aircraft) Ltd.'s new military aircraft office.

**J. R. White** appointed sales mgr. of aviation products div. of Fenwal, Inc.

**William W. Letch** named gen. mgr. of vibration div. of MB Manufacturing

Co., a division of Textron, Inc.

**Eugene D. Stafford** appointed chief of flight operations for Goodyear Aircraft Corp.'s heavier-than-air fleet at Akron, O.

**Donald C. Erdman** named asst. to president, Sperry Products, Inc.

**Maj. James Wattenbarger** appointed national sales mgr. for Aviation Analysts, Inc.

**Everett W. Thompson** named supervisor of turboprop contracts, Allison div. of General Motors Corp.

## AIRLINE

**Edmund O. Schroeder** elected vp-maintenance of Seaboard & Western Airlines; **Ogden C. Gorman** appointed European sales mgr., with headquarters in Luxembourg.

**James Montgomery** appointed director-sales development, Pan American World Airways.

**Thomas M. Makurat** promoted to sales promotion mgr. for Frontier Airlines.

**Dudley Dunn** appointed mgr., east coast North America, for Qantas Empire Airways.

**Kermit H. McKay** appointed regional chief pilot for Western Air Lines at Salt Lake City, succeeding **A. S. Mooney, Jr.**, who has returned to flying the line.

**Robert J. McCabe** named interline and agency sales mgr. for Japan Air Lines, replacing **Peter Murray**, now district sales mgr. of Transocean Air Lines in Honolulu.

**A. C. Northrop** promoted to mgr. of regional affairs for United Air Lines for the New England area.

**Avis, Inc.** announces the following vice presidents: **Sidney Wylie**, asst. treas.; **Frank B. Charnatz**, gen. mgr. of licensee div.; **Lewis Hill**, controller; **Clay Barnes**, midwestern district mgr.

## HONOR ROLL

(For 25 years or more service in the industry)

**W. H. Alleman**, United Air Lines. Chief, technical services, San Francisco.

**G. E. Casseday**, United Air Lines. General foreman, San Francisco.

**C. E. Haneline**, United Air Lines. Manager, ground services, Los Angeles.

**W. L. Henderson**, United Air Lines. Staff assistant, San Francisco.

**J. B. Leonard**, United Air Lines. Facilities planning engineer, San Francisco.

**C. E. Libby**, United Air Lines. Lead shop mechanic, San Francisco.

**C. L. Moser**, United Air Lines. Lead shop mechanic, Chicago.

**E. W. Nieman**, United Air Lines. Lead shop mechanic, Chicago.

**Agnes Pearson**, United Air Lines. Correspondent, Chicago.

**F. W. Phillips**, United Air Lines. Foreman, San Francisco.

**R. B. Shanks**, United Air Lines. General foreman, San Francisco.

**C. B. Staley**, United Air Lines. Lead shop mechanic, San Francisco.

**H. F. Sweeney**, United Air Lines. Station ground services mgr., Salem, Ore.

**G. S. Taylor**, United Air Lines. Station ground services mgr., Reno.

**J. W. Wilcock**, United Air Lines. General foreman, San Francisco.

**Jens S. Knudson**, Northwest Airlines. Sr. control agent, Minneapolis.

**Russell K. Sorkness**, Northwest Airlines. Check pilot, Seattle.

## VISION A SAGA OF THE SKY



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AIRLINES



# West Coast Talk . . . By Fred S. Hunter

**Hibbard straightened out Lockheed's Missiles System Division in fruitful year at helm.**

**G**ENE ROOT'S advance to vice-president and general manager of Lockheed's Missile Systems Division serves to point up the accomplishments of Hall L. Hibbard during his year of stewardship. Few people, even in the industry, realize the enormity of the task Hibbard faced when he was precipitated into the MSD breach following the resignation of Elwood R. Quesada over management policy differences. The division was torn by dissension and its prospects looked anything but promising.

Hibbard had no more than hung up his hat at Van Nuys than he was confronted with a walk-out by a group of the division's top scientists, also a policy clash. At first, Lockheed started looking for a strong man to bring in to take over the division's management. But after awhile it quit hunting. Acting General Manager Hibbard was doing such an outstanding job putting the division back on the track—and accelerating new progress—it became obvious the wise thing to do was let him finish the job before selecting a permanent general manager.

The Hibbard achievement at MSD, it might be added, becomes all the more remarkable considering this was a part-time job. He had to save out some time to devote to his other job, vice president of engineering for the corporation.

Douglas is quoting 370 mph for cruise speed for the DC-7C equipped with Curtiss-Wright EA4 engines. This means it will probably do 375 mph, or close to it, because Douglas invariably understates performance numbers on its transports. Thus it will be the fastest piston transport. This newest model of C-W's Turbo Compound engine will produce 1,975 hp on low blower, 1,950 hp on high blower.

First deliveries are scheduled for September 1957. Northwest Airlines is first in line for the new power. NWA's first eight DC-7Cs, scheduled for delivery starting in March, will be equipped with EA1 engines,

but its second batch of six will have the EA4s. Lockheed is now looking at the engine for possible Super Constellation application. Designation for the Model 1649 is EA5, for the Model 1049 EA6.



Hunter

Here's a clue to why Trans (North) American Airlines returns high profits. In the first year of operation, its two Douglas DC-6Bs logged airplane time as follows:

5,298 hours	370 days
14.3 hrs./day	
5,147 hours	361 days
14.2 hrs./day	

This is the first time any Douglas DC-6 or DC-7 series aircraft has ever flown more than 5,000 hours in any one year.

Convair will complete the full mockup of its Model 22 turbojet transport about February 1. Did we say Model 22? That's Convair's house number. Public designation is Model 880.

AiResearch is investing \$100,000 in new test equipment to duplicate jet engine frequencies as part of its jet transport program. AiResearch is well represented on both the Boeing and Douglas jets and the Lockheed Electra turboprop. One example of the step-up in the test program on AiResearch accessories—life test on the engine-driven compressor on the Lockheed Electra is 2,000 hours. Heretofore, 1,000 hours—or less—has been considered sufficient.

North American Aviation has applied to the CAA for a type certificate on its Model 246 twinjet utility plane. Full-scale mockup was recently completed and preliminary presentations already have been made to the Air Force.

Bonanza Air Lines isn't scheduled to receive its first F-27 until January, 1958, but it has started training on the Dart engines by enrolling supervisory personnel in the school at Montreal. It will gradually route all maintenance and inspection lead personnel through the school.

## To the ENGINEER of high ability

Through the efforts of engineers The Garrett Corporation has become a leader in many outstanding aircraft component and system fields.

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- electronic computers and controls
- turbomachinery

The Garrett Corporation is also applying this engineering skill to the vitally important missile system fields, and has made important advances in prime engine development and in design of turbochargers and other industrial products.

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Airsupply - Air Cruisers  
AiResearch Aviation  
Service



## Mobile gas turbine power cart takes only 30 seconds to start giant B-52 jet engines

The AiResearch MA-1A mobile gas turbine compressor, the first unit of its kind qualified by the Air Force to start the intercontinental B-52 bombers of the Strategic Air Command, is now in volume production at the AiResearch Manufacturing Division of Arizona.

Entirely self-contained, it furnishes a completely automatic source of compressed air power at the point of use. All components, parts and accessories

are included in the fully-enclosed weather-proofed trailer.

The mobile unit weighs only 1150 pounds and may be controlled either from the instrument panel or from a remote control panel. It will start and maintain continuous operation at ambient temperatures ranging from  $-65^{\circ}\text{F}$  to  $130^{\circ}\text{F}$ , together with the other extremes of environmental conditions encountered at airports throughout the world.

The two-stage gas turbine compressor may be removed easily from its trailer for use in other vehicles or as a stationary unit. It has an output capacity of 120 pounds per minute flow at 50 psia... enough power to meet all ground service needs for a modern airplane.

Write to our Sales Planning Department for further information on this product.

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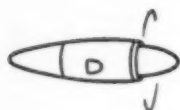
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# THE ERA OF THE ELAND



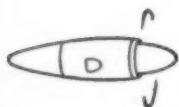
## How many development hours is 'know-how' worth?



Why is the Eland ahead of its time? The answer lies years back—in the steady accumulation of engineering skill and experience that forms the 'Napier tradition'. This 'know-how' made us decide on the single-spool as opposed to the twin-spool—and at the same time showed us the way to find the compressor we needed.

In 1947 it was clear to us that only by basic research on stage matching could we find that compressor—one which would make possible a single-spool turbo-prop with the simplicity, the economy, the power and flexibility of the Eland.

So we built at Liverpool the best-equipped gas-turbine research station in Europe. The original work we have carried out in that station has given us a knowledge of compressor problems—and their solutions—equalled by few other aircraft engine firms.



After thousands of hours of cascade work we determined by 1952 the right type of blade to use, its general aerofoil characteristics and the basic geometry of the compressor itself. Even at this stage, a very large number of possible compressors could have been built.

We now had to make a vital decision. Which prototypes—out of this very large possible number—should we build? Theory wasn't much help here.



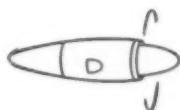
# IS BEGINNING . . .

Three examples of successful Napier Eland conversions: The Convair 340, The Elizabethan, The Varsity



We had to depend on 'know-how' and the engineering sixth sense it gives. The right answer could save us thousands of hours of work—the wrong answer could put us back years.

It was decided that we should start by building four compressors. When we had built the third we knew we had what we wanted! By now we have been able to put in three years steady development work on the same blade/compressor combination.



With a type test at 3,060 e.h.p. successfully completed we can say now that the Eland's design is basically sound, basically right, and will not have to be fundamentally altered in the years ahead. Of how many turbo-props can that be said? The Era of the Eland is beginning with an engine of *proved* safety and flexibility.

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Quebec. Tel: Victoria 3627

## Jet Business Aircraft Should Pay Off, Continental Can Co. Pilot Figures

Any corporation with a requirement for 300,000 miles or more of annual air transportation can profitably use a jet transport in the Fairchild M-185 class, according to Stephen Brown, chief pilot of Continental Can Co. Continental recently inaugurated the jet era for business aircraft when it placed the first order for three Fairchild M-185 10-place jet transports.

Continental has such a requirement, Brown declared, "because of the normal increase in our business and the addition of new companies, including a few without aircraft, that have added many more plant cities to our air routes. This will mean a greater premium on our air transportation system and the speed of the M-185s will provide the means of covering the additional miles we will have to travel."

Continental expects to increase the air miles available to the company 100% by operating the three jets plus the Fairchild F-27 turboprop transport also on order. The three M-185s alone will fly 50% more miles than the company's present five-place piston fleet at twice the speed.

And, Brown revealed, all this will be accomplished at a lower per mile operating cost. Basing his computations on the Air Transport Association's cost formula, Brown estimated that the M-185 would cost about \$1.05 per mile, based on a minimum 600-hour utilization and a 10-year amortization period. Annual cost, he noted, would be about \$324,000 operating at a mileage average of 500 mph.

The \$1.05 estimate was found to be lower than operating costs for DC-3 (\$1.46), Lodestar (\$1.20), Mark II Learstar (\$1.20), Super PV (\$1.19).

Fairchild F-27 is estimated to cost \$1.18 per mile, higher than the M-185 but lower than the pistons. (See table for breakdown.)

In making his computations on the ATA formula, Brown doubled the per miles fuel cost, since corporate aircraft operators rarely pump their own fuel usually paying standard retail rates at airports.

Continental Can maintains its own fuel supply at its Morristown, N. J., base and can save five cents per gallon by buying jet fuel in bulk. But Brown pointed out, 50% of the fuel required would still have to be purchased at higher rates elsewhere around the country.

Another advantage cited by the chief pilot for the M-185 is an important reduction in "deadhead flying time." Speed of the jet increases the plane's availability, he noted. For example, the M-185 without passengers can be flown from Miami to New York in 2 hrs. and 20 min. compared to the present six hours in piston equipment. "We could 'deadhead' the M-185 at 50¢ a mile, because our only cost factors would be the pro-rated crew salary, fuel and maintenance."

### Pacific Airmotive Buys Learcraft Conversions

Lear, Inc. has sold its Learcraft Conversions, Inc. subsidiary to Pacific Airmotive Corp. of Burbank, Calif. Included in the sale is Lear's aircraft engineering division, which engineered and is producing the Learstar Mark I and Mark II.

PAC has announced that Learstar production "will continue without interruption" at Santa Monica, as will

modification, maintenance and overhaul of other business aircraft types.

PAC will operate its new subsidiary as a separate corporation under the name PacAero Engineering Corp. Vernon B. Benfer, former general manager for the Lear division, has been named president of the new company.

To date, 20 Learstars have been delivered and are in business aircraft operation.

While sale price was not disclosed, PAC acquired 100% of the subsidiary's stock. The negotiation included transfer to Lear of 70,000 shares of PAC stock in exchange.

### Gen. Clay Explains Withdrawal from NBAA

Private aircraft owners' associations should not attempt to take positions in highly technical matters which are under study by the government, according to Gen. Lucius B. Clay, board chairman of the Continental Can Co. Gen. Clay gave this belief as his reason for resigning from the advisory council of the National Business Aircraft Association during the last heat of the Tacan-DME controversy.

First public disclosure of the official reason behind the resignation was recently made by the Aircraft Owners & Pilots Association in the release of an exchange of letters. Max Karant, AOPA vice president, had written the retired general for an explanation of the resignation, asking whether it was caused by NBAA's stand in the Tacan controversy.

Gen. Clay replied: "I do not believe that an association of private aircraft owners should attempt to take positions in highly technical matters which are under study by government. Moreover, I am convinced that the investment in present facilities should not be a deciding factor in determining future equipment. For these reasons, I did refuse to accept the positions taken by NBAA and resigned from its advisory board."

Karant, in reply to Gen. Clay, challenged the position: "One of the most important responsibilities of an association like ours is to concern itself most diligently with any such proposal that will have so far-reaching an effect on the welfare of the many American citizens served by that association. And any association that lacks the integrity and courage to challenge such threats to the civil economy is not serving either its members or the country."

While Gen. Clay has not yet responded to Karant's rebuttal, NBAA president Henry Boggess issued the following comment:

"NBAA has no regrets in the posi-

**Comparative Operating Data for Jet and Piston Engine Business Planes**

Aircraft	Cruise Speed	Cost	Amortization Period	Cost (per mile)
Fairchild M-185	500 mph	\$950,000*	10 yrs.	\$1.05
Fairchild F-27	280 mph	750,000*	10 yrs.	1.18
Lodestar	220 mph	250,000	4 yrs.	1.20
Mark II Learstar	265 mph	350,000	4 yrs.	1.20
Super PV	300 mph	450,000	4 yrs.	1.19
DC-3	200 mph	300,000	4 yrs.	1.46

\* Price includes special interiors, radio and spare parts.

NOTE: Computations based on Air Transport Assn. cost formula but with per mile fuel cost doubled, since corporate aircraft pay standard retail rates at various airports.

# CAPABILITIES . . . Manpower, Tools and Experience

The amazing photograph at right was taken by Tom Ashley, managing editor of *Flight Magazine*, at the National Aircraft Show in Oklahoma City over the Labor Day weekend. It shows a U. S. Army L-23 Beechcraft making a successful takeoff and climb over a simulated obstacle, represented by the two poles. A previous takeoff by another make airplane had cut the upper ribbon, which the photo shows as broken. The number at the base of the pole represents the distance in yards from the beginning of the takeoff run of the L-23.



The U. S. Army L-23B transport, rugged military version of the famous Beechcraft Twin-Bonanza, has a proud and distinguished record of service. First ordered into military production in 1952, the L-23 was the first twin-engine airplane used by the Army Field Forces. From the battle fields of Korea to the training fields at home, and back again to foreign stations, the L-23 has met the exacting demands of military service with distinction. Today, the Army's confidence in the L-23B's dependability and superior performance has resulted in new orders to fill the Army Aviation Division's expanding needs.

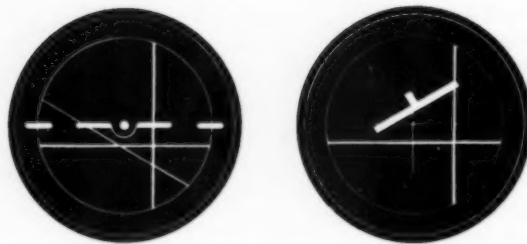
We're happy to welcome the United States Army to the long list of enthusiastic "re-order customers" . . . evidence again that Beechcraft has the manpower, tools and experience capabilities to design and produce quality aviation products.

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	8-PLACE BEECHCRAFT SUPER 18
	6-PLACE BEECHCRAFT TWIN-BONANZA
	4-PLACE BEECHCRAFT BONANZA
	BEECHCRAFT T-34 TRAINERS
	BEECHCRAFT L-23 TRANSPORTS
	TANK-WING-MAJOR SUBASSEMBLY SUBCONTRACT PRODUCTION

# Beechcraft

BEECH AIRCRAFT CORPORATION, WICHITA, KANSAS, U. S. A.





Which instrument helps the pilot do the right thing the fastest—the one with the moving horizon, or the moving aircraft? Or is there yet a better way? To the pilot flying at supersonic speed, the difference in reaction time is highly critical. This is typical of the “human engineering” problems Honeywell Aero considers in developing advanced control and instrumentation systems for aircraft.

AERONAUTICAL DIVISION, MINNEAPOLIS-HONEYWELL

tion it took throughout the controversy. It is unfortunate that the press interpreted our wire of congratulations to Secretary Rothschild [Undersecretary of Commerce Louis Rothschild] after a government decision was rendered as having switched its stand. Nothing could be further from the truth. Our fight was waged until the government made a decision. When that decision was made, we accepted it in a proper American spirit and urged full speed ahead in implementing the new system."

## Piper Building Two All-Metal Aircraft

Piper Aircraft Co. will offer two versions of its first all-metal high-performance business aircraft. In announcing preliminary details, the company revealed that its new Comanche will be available with a 180-hp, 4-cylinder Lycoming engine or with a 250-hp, 6-cylinder Lycoming engine.

The low-powered version, designated the PA-24 Comanche, will be available April 1, the more powerful model around December 1, 1957. The PA-24 has a target price of \$13,500 and the 250-hp version about \$16,900.

While performance figures have not yet been released, the company did announce the useful load of the 180-hp version will be 1,100 lbs. and for the 250-hp version 1,200 lbs. Fuel capacity will be 50 gallons for a five-hour range with provision made for a 10-gallon fuel reserve.

All Piper cares to say about the speed at this time is that the PA-24 will be "faster than any other production plane in its price class" and the 250-hp model about 25 mph faster.

Details were first revealed at the recent Piper distributor meeting in Lock Haven, Pa. At the same time, a sales increase of 55% by Piper distributors was reported for 1956 over 1955.

## Phosphate Insecticides Blamed for Accidents

Phosphate insecticides may be the possible cause of the increasing fatalities in crop-dusting aircraft accidents. The possibility was recently suggested by C. A. (Bud) Moore, director of the Mississippi Aeronautics Commission.

In a letter to the Flight Safety Foundation, Moore wrote: "We now have reason to believe that the increase in fatalities is positively due to the use of phosphate insecticides."

Moore said the blood of a pilot who died after his plane went into "sudden, erratic motions and crashed" was found to be "saturated with such chemicals."

## Cessna Unveils 1957 Models 180, 182



Cessna Model 180



Cessna Model 182

Cessna Aircraft Co. this week unveiled its 1957 Models 180 and 182. Major change in both models, powered by a 230-hp Continental 0-470-L engine, is new carburetor which improves fuel consumption. Gross weight has been increased to 2,650 lbs.

Of all-metal construction, 182 is priced at \$13,975 and 180 at \$13,250, f.a.f. Wichita. Both planes go on dealer display December 15 and 16.

"Land-O-Matic" tricycle landing gear has been lowered on Model 182 to increase stability in high gusting winds. Main gear has been lowered four inches with the trend expanded 5.4 in. and the nose gear lowered 2 in., resulting in an attitude change with ground angle of about 7 degrees. Propeller clearance is same as in 1956 models. This has been accomplished by rotating the entire fuselage down with the prop hub as the axis and increasing main gear legs in thickness and tire ply from 4 to 6.

Castering wheels are now standard equipment on new Model 180, which continues to be equipped with spring steel conventional landing gear. In addition to cross-wing gear, Model 180 has had its cowling redesigned.

## Business Flying Briefs

- Aerojet-General Corp., Azusa, Calif. has reported that its 15KS-1000-A1 standby rocket engines have been installed on a variety of business aircraft, including a Convair 240, Douglas DC-3, Howard Super Ventura, Lodestar, Ventura and B-25. More than 80 installations are currently scheduled.

- Wings, Inc. at Philadelphia's Wings Field has announced the cancellation of dealer agreements with Beech and Piper aircraft companies. Instead, the firm has signed a direct factory-dealer contract with Cessna for sale of its complete aircraft line.

*The Men Who Are Air France*

No. 4 OF A SERIES



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Regional Representation of Madagascar.

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# TRANSPORT TRENDS

Washington, D. C., Dec. 3, 1956

DOMESTIC TRUNKLINES' 1956 PROFIT may not reach last year's total of \$63.1 million. Expenses continued to rise faster than revenues in the third quarter. As a matter of fact, the trend was even more marked than in the first half. Third quarter expenses jumped 14.2% over last year; revenue gained 9.2%. It should be remembered that this is the picture of the trunkline group as a whole. Some carriers are doing better than last year; their profits will be higher. Others aren't doing as well.

Here's the picture for the first nine months of this year: revenues of the trunks were up 11.1%; expenses rose 13.8%. Net profit was \$47.9 million, a \$3.9 million drop from the \$51.8 million recorded in the same 1955 period.

Thus, to equal 1955's \$63.1 million, the fourth quarter profit must be \$15.2 million. It's possible, of course. Traffic reports are optimistic. But profit must exceed that of last year's fourth quarter, which totaled \$14.3 million. Last quarter of 1954 showed \$18.9 million net.

●  
WHITE HOUSE ACTION is expected soon on the New York-Nassau case. CAB, by a 3-2 vote, recommends certification of Pan American World Airways for nonstop rights on the route. Delaying White House approval has been the question of whether PAA, which now has Nassau-Miami rights, should be restricted to prevent one-stop New York-Miami service via Nassau, which might be competitive with New York-Miami flights of other lines.

●  
THE VOTE OF THE CAB CHAIRMAN continues to be the "swing" vote in major cases. And not since March, 1955, when Chairman Ross Rizley started his one-year stay in office, has a chairman been on the losing side of a split vote. Current Chairman James R. Durfee has generally followed Rizley's lead and cast his vote with the Board's two Democrats to form the most consistent majority. One exception has been the New York-Nassau case, in which Durfee joined Republicans Gurney and Denny to vote for Pan American.

●  
CAPITAL GAINS BILL is expected to be introduced again in next Congress. This bill would allow subsidized airlines to reinvest profits from sale of equipment in new equipment without suffering a subsidy loss at the hands of CAB. Measure passed the Senate at the last session, but was sent back to committee in the House. Some Congressmen alleged that Pan American would be the principal beneficiary if the bill became law.

But local service lines have a vital interest in the legislation. Some have ordered new planes. They need proceeds from sale of old equipment to help with financing. Same applies to territorial operators.

●  
CHANGEOVERS IN AT LEAST THREE top CAB staff posts appear certain after the first of the year. And more may take place if the Senate's public hearings on the New York-Florida case "leaks" are as sensational as expected.

●  
CAB'S COMPLIANCE OFFICE is wrapping up a thorough investigation of charter operations between California and Las Vegas gambling casinos. A general crackdown is likely.

# TRANSPORT AVIATION

## Here's What American Plans for Jet Age

New concepts of comfort are being designed into Lockheed Electra interiors; ticket offices to be built or remodeled in uniform pattern.



Lockheed Electra's Continental Sky Lounge, developed by company engineers with aid of Henry Dreyfuss industrial design organization, is last word in aircraft interior design. Wider fuselage, transverse hat racks, table and lamp arrangement are among features.

By FRED S. HUNTER

A new era looms ahead for American Airlines, not only in the turbine power of its future flight equipment, but in a systemwide program of modern design.

This is more than a streamlining project. Entailed are new concepts, ranging from the remodeling of a ticket office to the appointments in a new \$1,000,000 (or more) school for stewardesses, and including such seemingly unlikely items as maintenance hangars and ground-handling equipment at airports.

Right at this moment, AA's best kept secret—from its competitors—is its design for the cabin interiors of its forthcoming Boeing 707 jet transports.

This will be completely new, admits E. Gilbert Mason, AA's director of industrial design. But he can't talk about it now. Except to say: "We're sure it will help us maintain our leadership in the domestic passenger market."

• An advance hint of things to come was contained in the recent announce-

ment of the interior treatment chosen by AA for its turboprop Lockheed Electras. It involves the use of low-back seats for the first time in airline transports.

"Why should we always put high-back seats in airplanes?" asks Mason. "We sit in low-back seats in our automobiles, in our homes, in restaurants and in theaters. They're comfortable."

### Objective: More Sales

AA's big redesign program is strictly in the interest of selling more tickets. The "living-room look" for AA's Electras, for example, had its origin in the carrier's economics. Lockheed's two-abreast seating arrangement for the Electra added up to 66 seats. AA's economic planning department wanted 10 more to put better balance into its cost curves.

That's when Mason came into the picture, and went to work with Lon Storey, Jr., Lockheed's Electra project engineer, and the staff of Henry Dreyfuss, Lockheed's consulting industrial designer, on the new lounge-like seat-

ing arrangement. The result—the needed 76 seats, plus a more attractive looking cabin interior.

•With his low-back seats, AA's Mason flouts tradition on a second score. They don't recline. They've been designed with a 28-degree fixed recline and they also have a form-fitting seat. They won't be tiring, Mason says. At the end of a flight you'll feel more relaxed than in other types of seats. Your neighbors will feel better, too.

"At full recline, you're in the lap of the passenger in the seat behind you," Mason points out. "He's pinned in the seat and can't get out."

But in the club-fashioned Electra, you disturb no one. You can stand erect and move about as you please. You won't even hit your head on a hat rack. It isn't there. Instead, transverse hat racks have been built on the partitions dividing compartments.

Mason and his designer associates would have carried the lounge-like concept throughout the Electra. But Senior Vice President O. M. Mosier and AA's operations department demurred. Too

big a step to take all at once. So, AA Electras will be "compartmentized," including two standard cabin treatments, each with three rows of two-and-two reclining airline seats available for passengers who like the old style.

Mason expects to see passengers show a marked preference for the table-and-lamp lounges in the Electra, and so does this writer after looking over the new-type arrangement in the mockup of the Lockheed fuselage at Burbank.

In addition to new methods of seating the people and new methods of getting them in and out of the airplanes, you'll see new upholstery, new curtains, new carpeting and a new exterior paint job in AA's forthcoming Lockheed Electras and Boeing 707s. Latter will be brighter, with more color and still better identification. "You'll know they're American when you see them on the ramp," says Mason.

• **American Airlines** is the first airline to establish a full-time department of industrial design in its corporate organization. This gives E. Gilbert Mason the distinction of being the first professional industrial designer to be placed full-time on an airline payroll. He formerly was an industrial design consultant with offices in California and Texas. He closed them to join AA in New York.

Mason is also an architect. He didn't want to lose touch with this phase of his work, so he hesitated when AA first approached him.

"Our program doesn't stop with aircraft," said President C. R. Smith. "We want our ticket offices, hangars, airport terminal facilities, reservation offices, all brought up to the highest point of design efficiency."

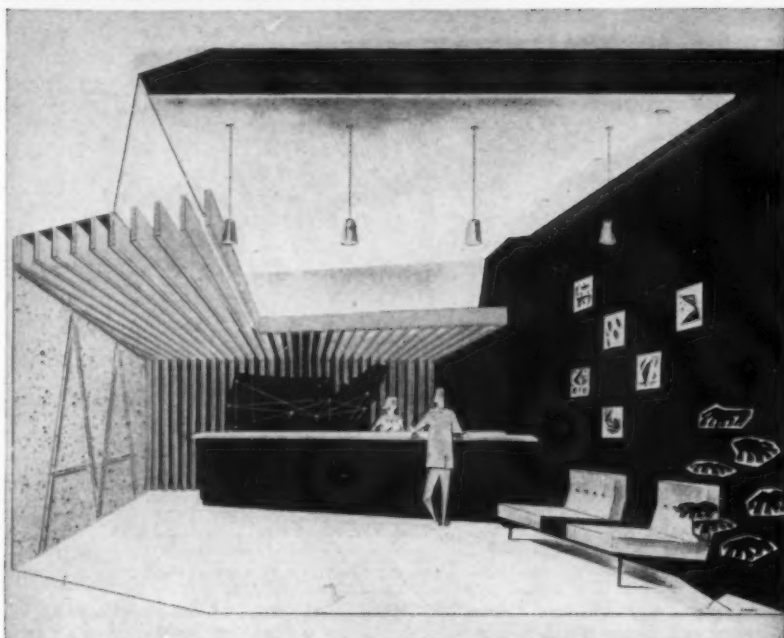
Smith's selection of Mason to head up an industrial design department for AA was a natural one. It was through Smith that Mason became interested in aircraft in the first place.

This took place during World War II when Smith was in uniform as deputy commander of the Army's Air Transport Command. In this capacity, Smith one day found himself confronted with the responsibility of working out cabin interiors of three VIP C-54s. One of these was the "Sacred Cow" for President Franklin D. Roosevelt. Smith thought of a young industrial designer he had known in Texas, Gil Mason. After the war Mason was industrial design consultant on the Douglas DC-6.

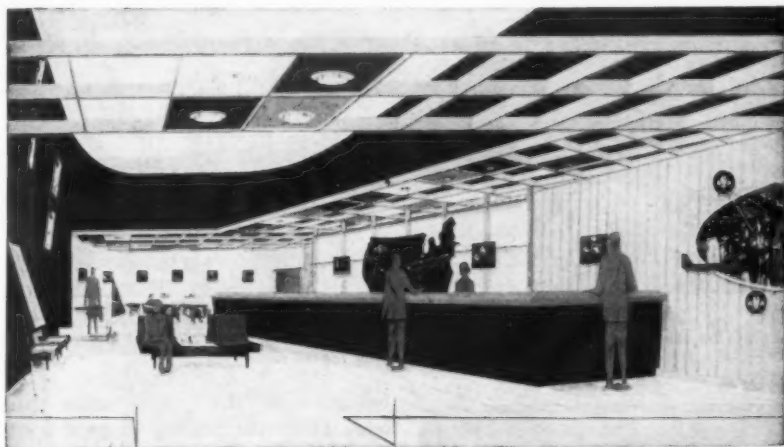
### Just Good Merchandising

Good merchandising spells out the philosophy of AA's ticket office program. This is an extensive project, involving in the current phase more than 40 ticket offices. They range in cost from \$30,000, for a smaller office, to

## AA's Modernized Sales Offices



Baltimore office illustrates economy of imaginative design. This modern-styled office cost \$47,000. It originally planned—before it established its own industrial design department—a conventional-type office for this location at an estimated cost of \$48,000.



Sixth Street in downtown Los Angeles, is known as Airline Row because of its many ticket offices. It will take on new beauty after this new interior planned for American Airlines' office at a cost approaching \$100,000.

\$150,000 for a big one. AA's large office on the corner of Wabash and Monroe in Chicago is one of the offices Mason's department will re-do.

Another will be the carrier's Sixth Street office in the heart of airline row in downtown Los Angeles. A number of the offices are brand new. Examples are those in the St. Francis Hotel building in San Francisco, the Prudential Building in Chicago and the corner of Hollywood and Vine in Hollywood. Hollywood and Vine is one of the glamour corners of the world, but Mason and AA have given it an added

glamour with this bright and modern ticket office.

AA would like to have its ticket offices all alike. Location circumstances make this impossible. But all of the AA offices in the program, both the new designs and the redesigns, will have the same flavor. You'll know you are in an American Airlines office in any one. Colors and materials will be characteristic.

Mason employs three basic colors, a red, a golden tan and a blue, in his design scheme. These are pleasant colors, the kind of colors people will re-





An example of how American Airlines will improve identification of mid-block locations, as contrasted with corner offices, is shown in this plan for a new front for the carrier's downtown Los Angeles office.



Here's the way American Airlines proposes to make its hangar at Idlewild a more attractive part of the landscape and at the same time capitalize on the opportunity to advertise the airline by this program of identification.



E. Gilbert Mason, AA's director of industrial design, says modernization will "help us maintain our leadership" in domestic market.

member and talk about, colors that come under the heading of good merchandising.

• A vinyl-coated material developed exclusively for AA is another feature of Mason's ticket office design. It has a texture effect, looks like a fabric, and absorbs light. But it's easy to maintain. Thus it has muchly desired decorative effect, and at the same time simplifies the housekeeping job.

It also should be pointed out that AA isn't hiding its light under a bushel in its ticket office program. The fine subtleties of the industrial design art are well demonstrated by the big letters and the brilliant neon of AA's new signs. They hit you right in the eye.

Among other chores being tackled in AA's current industrial design program is an extension of the Admiral Club program. Redesign of the Ad-

mirals' Club in Washington was completed recently. The New York and Los Angeles club rooms are scheduled for redesign shortly. New clubs are to be established in San Francisco, Dallas and Detroit.

• Finally there will be the new stewardess school at Fort Worth. This will be a sort of combined classroom building and sorority house having a capacity for 170 stewardesses. It's called a million-dollar school facility. It will be quite a de luxe affair.

There are good reasons for the luxuriousness of the school for stewardesses. One, of course, is to add to the attractiveness of a stewardess' career with AA. The other represents practical advance planning. If AA outgrows it, or for some other reason finds it expedient to dispose of it, it can be sold for use as a first-class motor hotel. ♦ ♦ ♦

## Candidates Pile Up 220,000 Air Miles

Air travel accounted for almost a quarter of a million miles of campaign travel in the recent presidential election, according to estimates of the Republican and Democratic parties.

Total was placed at "more than 220,000 airmiles" for 1956 as compared to 178,275 four years ago. In addition to charter flights, Air Transport Association reports that "hundreds of speakers and other people who traveled on campaign business used regularly scheduled airline services." Approximately 100,000 scheduled airline reservations were made by those people, ATA said.

Only air mileage of any consequence run up by any candidate other than via scheduled airlines was the 17,463 miles covered by President Eisenhower in his plane "Columbine II."

American Airlines, United Air Lines and Trans World Airlines furnished four-engine equipment for the campaign charters. National Airlines and Continental Air Lines were among contributors of twin-engined aircraft.

## NCA, Frontier Get Nod

North Central Airlines and Frontier Airlines were recommended for temporary certificates at various points for which Braniff Airways' certificate has expired. CAB Examiner Paul Pfeiffer recommended North Central for extension from Grand Forks, N. D., to Omaha, Neb., via Fargo, N. D., Watertown, Brookings, Sioux Falls and Yankton, S. D.; Sioux City, Iowa, and Norfolk, Neb. FAL was recommended for Bismarck, N. D., to Sioux Falls, S. D., via Aberdeen, Huron and Mitchell, S. D.



## State Dep't Parley Promises Government, Industry Cooperation

A new era of cooperation between government and industry in the matter of bilateral air transport negotiations was promised when the State Department conducted a three-day seminar in Washington Nov. 14-16.

Attending were officials of the nation's airlines, aircraft manufacturing firms and top State and CAB offices. It was the first such meeting of its kind and appeared to be a direct result of Senate hearings conducted early in the year by Sen. George A. Smathers (D-Fla.).

Critical of U.S. handling of the German bilateral air agreement, Smathers dug into the entire picture of U.S. negotiating practices and issued a highly-critical report which indicated U.S. airline interests were being submerged in this country's deals with foreign nations.

The meeting in Washington indicated a fresh approach would be taken by the State Department. No policy decisions were reached or expected at the three-day meeting but industry officials were assured that their views would be "taken into consideration in the development of U.S. policy and in the conduct of U.S. transport relations with other countries."

In the long run, the industry seeks more emphasis in the State Department on aviation, possibly through creation of new and higher offices. Also, the industry is seeking personal representation on U.S. negotiating teams. The November meeting, of course, did not produce commitments on those points but the general agreement that similar meetings should be called in the future was considered a promising sign by industry representatives.

## Travel Agents to Get Standard Ticket?

First big step in a program to streamline processing of airline tickets by travel agents came recently as the Air Traffic Conference approved in principle a standard ticket to be used for all carriers. However, a number of technical details remain to be worked out before final adoption.

At present, usual practice is for travel agents to carry ticket stock for all airlines having them under appointment.

Another feature of plan being tentatively endorsed is a centralized banking arrangement for settling of accounts. Under revamped setup, agents would report to a group of designated "area"

banks instead of to individual airlines.

It is understood banks in New York, Chicago, Los Angeles, Seattle, Jacksonville and Dallas probably will be used.

## UAT Orders 3 DC-8s

UAT-Aeromaritime, French independent airline, has ordered three Douglas DC-8 jet transports and optioned two others for use on its routes such as Paris-Johannesburg.

First three DC-8s are slated for delivery in the first half of 1960. Remaining two, if option is exercised, will be delivered in 1962.

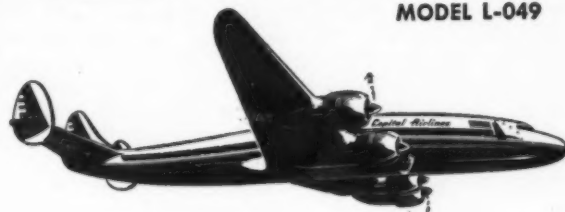
## CAB Visits Jet Plants On West Coast

Civil Aeronautics Board's five members and a number of staff personnel departed last week on an inspection and educational tour of west coast manufacturers building jet and turboprop transports.

Board plans to visit Boeing, Douglas, Lockheed and Convair and will be given a demonstration flight aboard the 707 prototype during the stay in Seattle. CAB Chairman James R. Durfee indicated the tour is intended to aid the Board in preparing rules for the jet age.

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# Airlines Differ Sharply on Hydraulic Systems, Fluids for Jet Aircraft

By JOSEPH S. MURPHY

Detroit—The U.S. scheduled airlines may be generally in agreement on the various types of jet and turbo-prop transports they will buy, but apparently that's where the similarity ends.

When it comes to setting down the technical details of the various aircraft systems they prefer, the carriers are just as far apart—perhaps farther—than they have been in piston engine buying.

At least that's the situation in hydraulics. There are almost as many combinations of preferences for types of hydraulic fluids and hydraulic system fittings as there are airlines and airplane models.

This was evident here recently as more than 100 representatives of U.S. and foreign airlines, aircraft manufacturers and hydraulics equipment producers convened for the 6th Transport Aircraft Hydraulic Conference sponsored by Vickers, Inc.

- **In the fluid field, it's Monsanto's** fire-resistant Skydrol bidding against MIL-O-5606 mineral oil and facing a weight disadvantage of as much as 65 pounds in the 35-gallon hydraulic system of the Boeing 707 jet.

Pan American World Airways, first to order both the 707 and the Douglas DC-8, is specifying Skydrol 500 fluid in both planes. United is following suit in its DC-8s, but Eastern Air Lines at this stage is favoring MIL-O-5606.

In the 707, Trans World Airlines is staying with mineral oil and American, which gets the 5606 fluid in its Lockheed Electras, hasn't positively decided which it will use.

- **In the case of AA, the present** trend indicates it might have to pay a premium to wind up with a standard fluid for its 707s and Electras. In other words, it probably would have to pay "extra" to depart from Skydrol in the Boeing jet, or to convert at this stage from MIL-O-5606 to Skydrol in its Electras.

In fact, the only area of any standardization in the fluid program rests with Electras and Convair 880s where all carriers now favor mineral oil.

And the conflict in opinion is not solely a U.S. situation. BOAC representatives indicate preference for fire-resistant fluid "wherever practical;" British European Airways reported favor for mineral oil.

In the choice of hydraulic tube fittings—the standard AN flared type versus Weatherhead's flareless Ermetto

—it's the same story.

Despite indications of a trend in favor of AN fittings, according to unofficial results of an airline survey this year by United, the majority of carriers are going to the flareless Ermetto fitting.

But here again there are some big names among the missing. Eastern Air Lines, for example, is ordering the AN type for its DC-8s and Electras; Delta is taking the same path on its DC-8s and Convair 880s, leaving only the Boeing 707 to be built with the same standards (flareless) for all airlines.

- **Boeing's decision in favor of the** flareless fitting was based on the considerable savings in weight that could be afforded by use of reduced wall thickness steel lines the flareless feature allows. However, on this aspect, United's Fred Blum warned that UAL is not looking forward to any campaign replacement of thin-wall tubing in its DC-8 fleet.

Throughout the two-day Vickers meeting, discussion of today's hydraulic service problems repeatedly became secondary to talks of future equipment developments.

Highlight in this area was the unveiling by Vickers' engineer Frank Moncher of a hydraulic-powered jet transport starting system which underwent first trials by Allison with the T56 last month.

The proposed Vickers system weighs about 170 lbs. complete, uses a McCullough or Porsche piston engine

as prime mover to drive a variable displacement pump. This in turn operates a fixed-stroke hydraulic motor to start jets up to 15,000-pound thrust ratings in 27 to 32 seconds.

Using such an arrangement, Moncher said, the engine mounted motor could be converted to hydraulic system duty as a pump, once engine starting has been completed.

Company officials estimate that a 2.5-gal. fuel tank for the piston engine would serve for about 25 separate starting operations. As an alternative, such a system also could be designed using the Solar Mars gas turbine as prime mover.

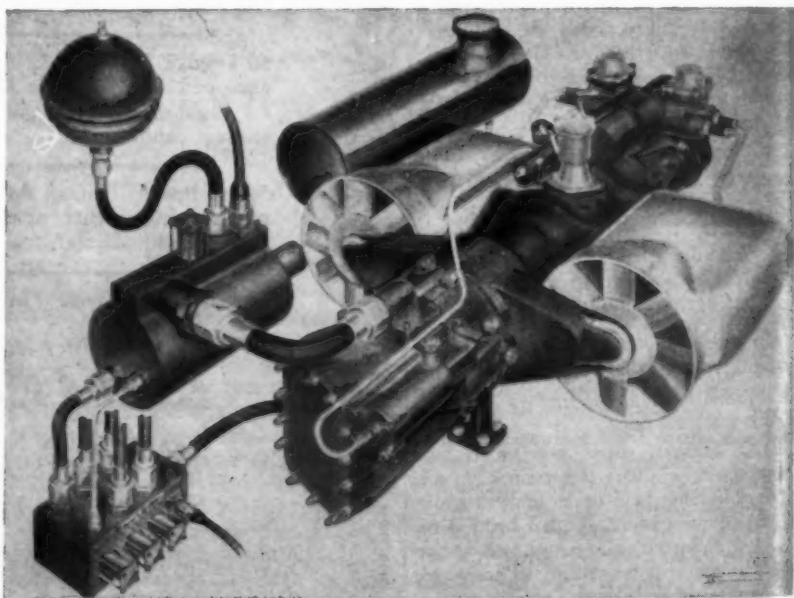
Among other Vickers developments disclosed by Moncher:

- **Eleven-cylinder pump**—Vickers has completed prototype design and initial test running of an 11-cylinder pump design as distinguished from its conventional 9-cylinder models. New unit is intended for higher pressure operation (5,000 psi) and tests at extended periods reportedly show promising results. For example, two units have operated successfully for 500 hours at 6,000-rpm speeds and 3,000 psi pressures.

- **Electra Pump**—New electric motor driven variable hydraulic pump being proposed by Vickers for the Lock-



Vickers-proposed Electra hydraulic pump.



Hydraulic jet engine starting package proposed by Vickers weighs about 170 lbs., is said to start engines rated up to 15,000 lbs. thrust in 27 to 32 seconds.

heed Electra is a 30-pound packaged design which uses hydraulic fluid to cool the motor at an estimated 40% weight saving over an equivalent capacity air-cooled motor. Unit is rated for 2,000 hr. life at normal operating speeds and pressures.

• **Contamination Tolerant Pump**—Interesting program at Vickers is a pump being developed for a specific application using MIL-L-7808 fluid in which hydraulic system is exposed to a high degree contamination. An experimental model has been run for more than 200 hours at temperatures from 300 to 350° F with oil drained from a jet engine and was found to be in excellent condition on teardown.

• **Clean Pump Program**—A companion program at Vickers is being directed toward development of a pump design that will minimize the contamination introduced into a hydraulic system from this source. Moncher says Vickers has been successful in delivering pumps that perform considerably better than the current "state of the art" in the generation of system contamination. ♦ ♦ ♦

## Interference A Problem In Warning Systems

An interference problem may occur if different systems of proximity warning detection are adopted by different users.

Hughes Aircraft Co. has reported that a pulse-system PWI it is developing could not share the same frequency band space used by a continuous wave system such as that under development by Collins Radio Co.

Representatives of the Federal Communications Commission, Civil Aeronautics Administration, the three military services and the aviation industry met this month to review the problems after Hughes voiced its concern.

Collins is developing a CW-FM radar in the S band at about 3,000 mc to do the job. Hughes is working on a pulse-type system that operates in the same region. CW signals of a certain level would blank out pulse-type returns from other aircraft.

Another possible problem, it was learned, might occur through interference from radar stations operated by the Army. The Navy, which anticipates installation of PWIs aboard carrier aircraft in 1958, proposed evaluation tests. Industry members strongly opposed this proposal on the basis tests might be inconclusive, would delay the civil program.

Possibilities exist for placing PWI frequencies somewhere between 2,700 and 3,700 mc. Some of the bands in this region are already in use for surface navigation and military equipment.

Further evaluation of the problem

is needed to determine:

- Whether two separate bands should be allocated for the different PWI systems.

- Lowest and highest frequencies on which PWI could perform, if the bands should be contiguous or spaced.

- What the interference considerations are with regard to other electronic equipments on nearby frequencies.

D. C. Beelar, attorney for Collins, told the assembly that industry was "one-half blind" in its approach to the problem because it did not have available information about Government facilities in operation in this part of the spectrum. ♦ ♦ ♦

Beelar asked whether the Interdepartmental Radio Advisory Council has a procedure with which to stop implementation of new frequency assignments contemplated for the spectrum under consideration. Such a procedure, in event FCC action is required to provide space for the PWI, could be of help now to provide adequate safeguards that space will be available when the issues are settled.

It was decided that special arrangements should be made for industry representatives who have appropriate security clearance to participate in special sessions of the FCC/IRAC Committee. ♦ ♦ ♦

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*These modern times: A New York commuter rushed up to American Airlines' airport ticket counter in Washington and asked, "When's the next plane to LaGuardia?" The agent answered, "We have a flight leaving in five minutes, sir." To which the commuter retorted, "Nothing sooner?"*

• • •

Domestic airlines' minimum time limit plan is working smoothly, but it's still too early to judge the effect on the no-show situation. Some lines think it's helped, others aren't sure. Air Traffic Conference's latest sampling shows that percentage of no-shows to boardings fell sharply between the third and fourth quarters of this year. First-class flights showed a no-shows-to-boardings percentage of almost 14% in the third quarter, and dropped to less than 12% in the fourth. Coach fell from 13.4% to 11%. But MTL didn't start until Sept. 16, so improvement may also be due to other factors. Airlines agree, however, that MTL has greatly reduced congestion at airport ticket counters, because passengers are buying tickets earlier.

• • •

*And speaking of MTL, put this down in your book: if ATC votes favorably on a no-show penalty, the plan probably won't become effective until next May or June, instead of February, as originally planned. ATC won't vote until mid-January. Then CAB approval is necessary, after which airlines must train personnel. Two-thirds of ATC members must vote in favor of a penalty, so it's still far from certain that there'll be a plan.*

• • •

About people: Sam Erwin, Curtiss-Wright's well-known vice president and general manager of the export division, is the second man to be recognized by United Air Lines as a 2,000,000-Miler. Columnist Robert Ruark was first . . . Congratulations to able Jack Slichter, Western's passenger service director, on his well-deserved special award from the Air Traffic Conference for his work on the industry's no-show control plan . . . A tip of the hat to our old friend, Gwin Hicks, president of Lake Central Airlines, who's celebrating his 25th anniversary in aviation. Started as sales manager of Quick Flying Service, Chehalis, Wash., in 1931, and held numerous other aviation jobs (he was an organizer of old Empire Airlines) before joining LCA . . .

## Sales, Traffic, Promotion

National Airlines is shifting its \$2-million-a-year advertising account, which has been handled for 10 years by Grant Advertising Inc., Miami. New agency will be Holte Agey Advertising Inc., Miami, effective Jan. 1. Holte Agey handled public relations and advertising for NAL several years ago, and later served as pubrel director for the city of Miami before opening his agency . . .

Delta Air Lines is now giving a "customer service citation" to an employee each month. Award is designed to "recognize acts of extra-effort service to Delta passengers—service involving personal time and sacrifice even beyond excellence in the performance of regular duties—on the part of Delta employees." Winner gets a share of Delta stock, certificate signed by president C. E. Woolman, complimentary letter from customer service committee, and a ribbon-type pin for his uniform . . .

The 60-millionth American Airlines timetable to be printed by Calvert-Hatch Co., Cleveland, has rolled off the press. It all started in 1935 with an eight-page timetable and a 20,000 press run. Normal run now is 500,000 and timetable is 48 pages. After the regular printing, which takes place six to eight times a year, AA runs off 60,000 air-coach timetables and 250,000 commuter quick reference schedules . . .

Recommended highly is Pan American World Airways' new book, "New Horizons, U.S.A." PAA's "New Horizons" was a guidebook for U.S. citizens going to far places. This one is for foreigners coming to the U.S. PAA points out that less rigid currency controls and better world business conditions made a trip to the U.S. possible for half a million visitors last year. The 510-page book covers 89 U.S. cities and gives complete information on hotels, points of interest, restaurants, stores, climate, etc. Also converts foreign weights and measures to U.S., gives information on currency,

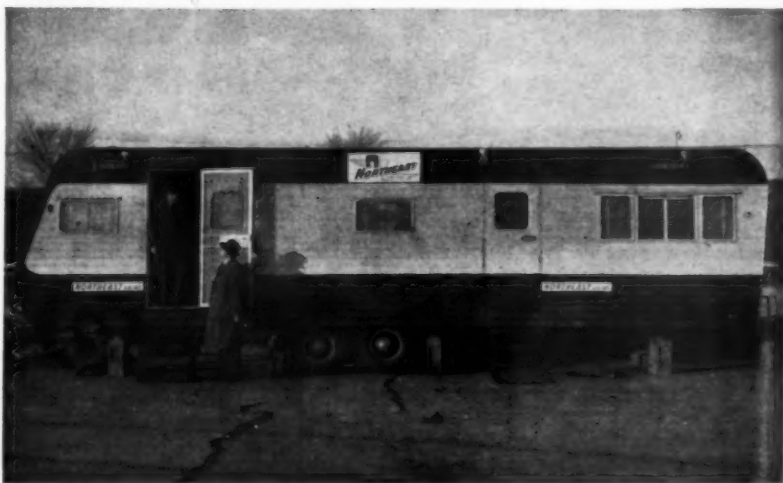
holidays, etc. The guidebook will be published in French, German, Italian and Spanish as well as English. The English edition will have initial printing of 80,000 copies. Available at \$1.95 through bookstores, PAA offices, or from PAA, Box 1111, New York 17, N. Y. . . .

Eastern Air Lines has published a new 50-page booklet about its Miami maintenance and operations base. The booklet, which has lots of pictures, is distributed to people on conducted tours of the base . . .

Readable TWA promotion piece points out that "a very scientific study of the worth of a wife to her husband has come up with the figure of \$63,298.03 for the average married life. We won't debate this amount . . . because most of us don't try to measure our wives' value in dollars and cents. But, if you take your wife on a trip to Europe between November and March, we can put a price tag on her fare—only \$322, Sky Tourist, New York to London and back, when she flies with you and you pay the regular fare of \$522" . . .

Capital Airlines, with usual high-quality direct-mail pieces, is plugging its new Washington-Milwaukee-Twin Cities Viscount service. Washington-Milwaukee flight of 2 hrs. 45 mins. is "more than an hour faster than any other service," Capital says, adding that Washington-Twin Cities is also "fastest" . . .

Pan American again won the Midwest Travel Writers Association's top award for best travel promotion by a common carrier. Credit goes to John Creedy, system pubrel director, and Rog Wolin, Latin American Division pubrel manager . . . PAA put out a special daily newspaper, patterned after its "Clipper" houseorgan, at the Chicago convention of American Society of Travel Agents. Top-flight editing job by Fred Tupper, of PAA's London pubrel office . . .



Shortage of space at Washington National Airport has forced Northeast Airlines to use a 35-ft. house trailer as an operations office. Company secured five-position ticket counter space in the north concourse and second-floor offices for some personnel, but was unable to get operations facilities at ramp level. It will use the trailer, positioned at Gate 19B, until a new finger is completed.



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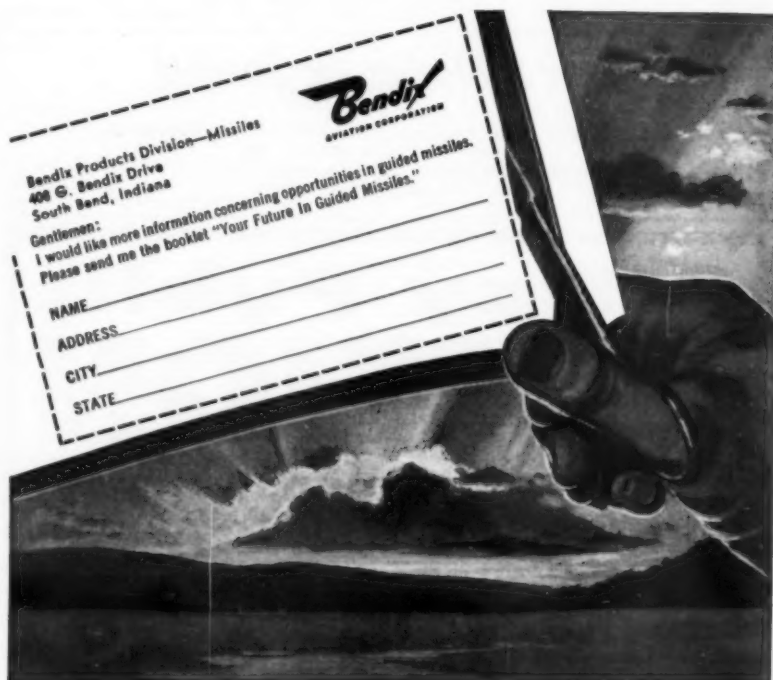
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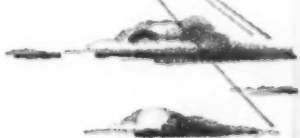
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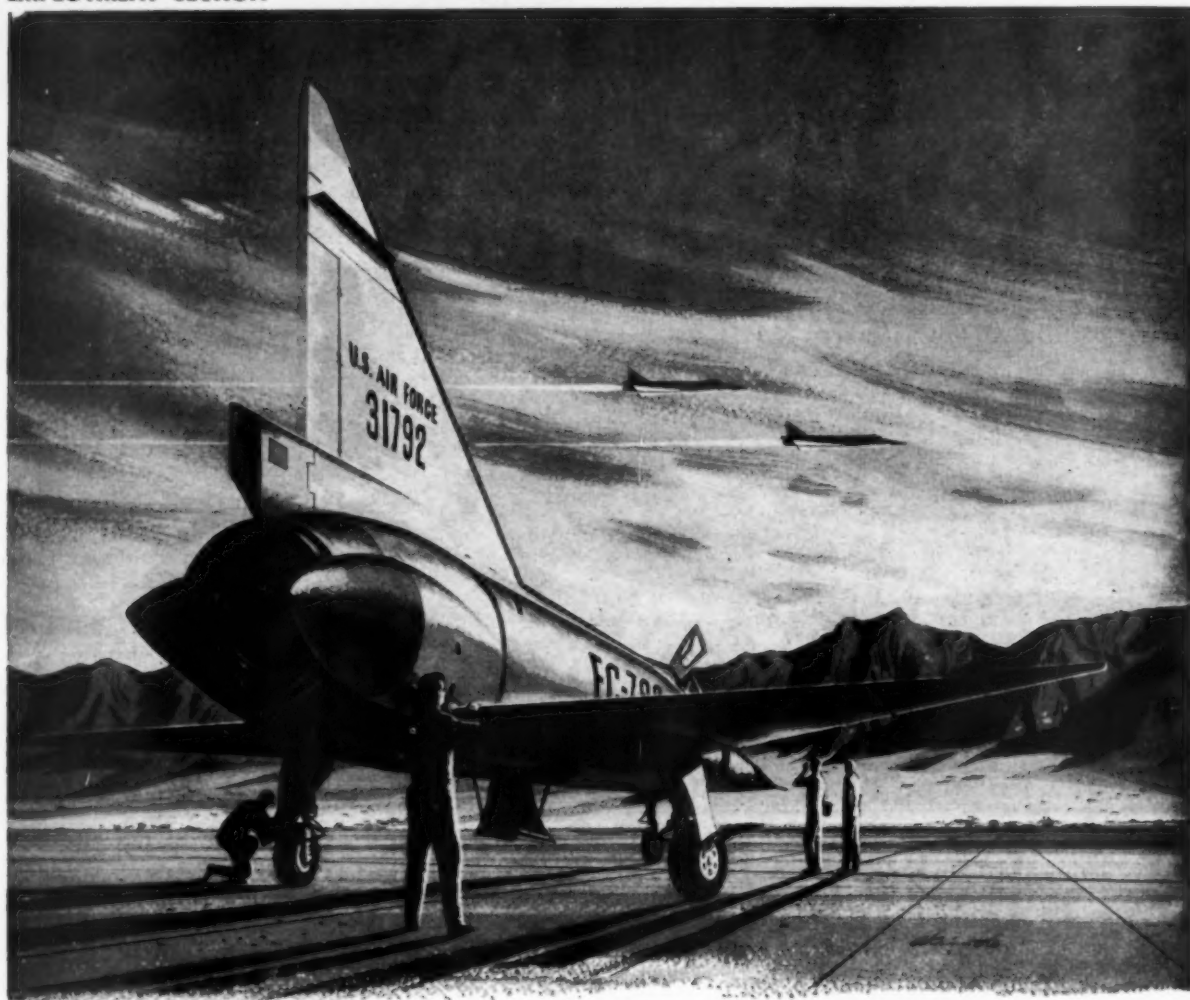
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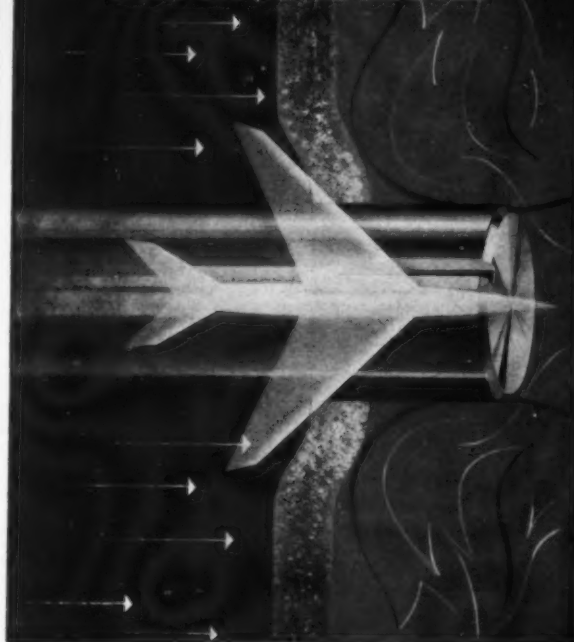
## ADVERTISERS' INDEX

Adel Precision Products, a Div.-General Metals Corp. ....	43
Airborne Accessories Corp. ....	11
Air France ....	72
AiResearch Manufacturing Company, Div. of The Garrett Corp. ....	64 & 65
Alpha Molykote Corp., The ....	55
B & H Instrument Company, Inc. ....	54
Beech Aircraft Corp. ....	69
Bell Aircraft Corp. ....	6
Belmont Plaza Hotel, The ....	39
Bendix Aviation Corp., Pacific Division ....	38
Braniff International Airways, Inc. ....	79
Bulletin Board (Classified) ....	81 & 82
Capital Airlines, Inc. ....	63 & 77
Champion Spark Plug Company ....	52 & 53
Chandler-Evans ....	32
CONVAIR—A Division of General Dynamics Corp. ....	1
Curtiss-Wright Corp. ....	62
Douglas Aircraft Company, Inc. ....	41
Duell, Sloan & Pearce ....	63
Elastic Stop Nut Corp. ....	2

### EMPLOYMENT SECTION

Bendix Aviation Corp., Bendix Products Division ....	82
CONVAIR—A Division of General Dynamics Corp. ....	84
Fairchild Engine & Airplane Corp. ....	3
Flightex Fabrics, Inc. ....	51
G. M. Giannini & Company, Inc. ....	26
B. F. Goodrich Company, The ....	18
Hamilton Standard Division, United Aircraft Corp. ....	61
Janitrol Aircraft-Automotive Div., Surface Combustion Corp. ....	49
Joy Manufacturing Company ....	4
Hotel Lexington ....	34
Lockheed Aircraft Corp. ....	37
M. C. Manufacturing Company ....	28
McDonnell Aircraft Corp. ....	83
Minneapolis-Honeywell Regulator Co., Aeronautical Division ....	70
D. Napier & Son, Ltd. ....	66 & 67
Narmco Resins & Coatings Company ....	27
National Aeronautical Corporation (NARCO) ....	8
North American Aviation, Inc., Rocketdyne Division ....	57
Northrop Aircraft, Inc. ....	10
Pennsylvania Fluorocarbon Company, Inc. ....	14
Phillips Petroleum Company ....	88
Purolator Products, Inc. ....	50
Resistoflex Corporation ....	15
Rheem Manufacturing Company, Government Products Division ....	35
Robinson Aviation, Inc. ....	56
Ralph C. Robinson Company ....	48
Rocketdyne Division, North American Aviation, Inc. ....	57
Servomechanisms, Inc. ....	87
Simplex Piston Ring Manufacturing Company ....	85
Solar Aircraft Company ....	47
Stewart-Warner Electronics, a Division of Stewart-Warner Corp. ....	31
Technical Development Company ....	55
Vickers-Armstrongs, Ltd. ....	44 & 45

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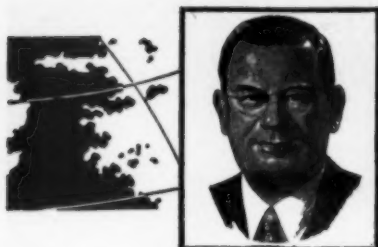
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## EN ROUTE...

WAYNE W. PARRISH

### Some Things Congo Tourists Don't See

It's amazing how much wildlife exists in the big Belgian Congo and how little of it the average tourist sees.

You can find plenty of wildlife if you go on a hunting expedition. You can see it close at hand in the Albert National Park, which is a big preserve with no hunting permitted. And you may come across wildlife while driving down a road.

But even if you don't see much of it, you're fully aware that it's there. For the natives it's a constant battle. The tourist sleeps well protected in camps and hotels, but the small isolated native villages are often an easy prey to wild visitors at night.

Our Sabena press party heard plenty of stories about natives being killed by lions and other animals. The annual death toll is considerable.

But we also heard how gorillas and large baboons carry off native girls and women into the forest thinking they are female gorillas. In every instance the gorilla is infuriated when discovering his mistake and kills the native female by biting her neck.

All of our party had looked forward to visiting the Albert National Park. We were promised lots of wildlife. Our road wound dizzily through mountains for a full day after leaving Butembo and climbed to over 7,000 feet, then descended several thousand feet onto a plain that adjoined Lake Albert east of the mountainous escarpment which forms a scar lengthwise through Central Africa.

It had been dry for a spell and we saw many forest fires in the mountains. Then, when we descended by a terrifically dusty road into the park area, we came up to a raging forest fire that even then was creeping toward our road. We knew at once that wildlife would be scarce in that part of the park. Dust and smoke hung in the air. It is always tragic to see a big fire gorging on a vast forest and grass area.

In driving part way across the plain to our camp, known as Ruindi Camp, we passed quite a few antelope and buffalo and other types, and even spotted a few elephants in the distance.

Our camp was picturesque, but the lack of rain had created a water problem. Our rooms were good, but the operation of the establishment by an unpleasant old gal left a lot to be de-

sired. There were few other guests. I imagine it's a lonely existence in that isolated spot, but a live-wire promoter could make the place a lot better.

After a much-needed bath—we were all covered with dust—we sat on the terrace as darkness fell and watched the line of fire on the mountain to the west. It had been burning for a week and was destroying a vast area.

Ruindi Camp is protected by a strong fence because wildlife often come up to the camp at night looking for food. But the main road entrance is open and during the night, we were told, some elephants came into the camp and wandered all over the place. When I awakened in the morning I looked out of my bedroom and saw several elephants grazing only a few hundred feet away. It's a case of human beings being fenced in because the animals have free run of the park.

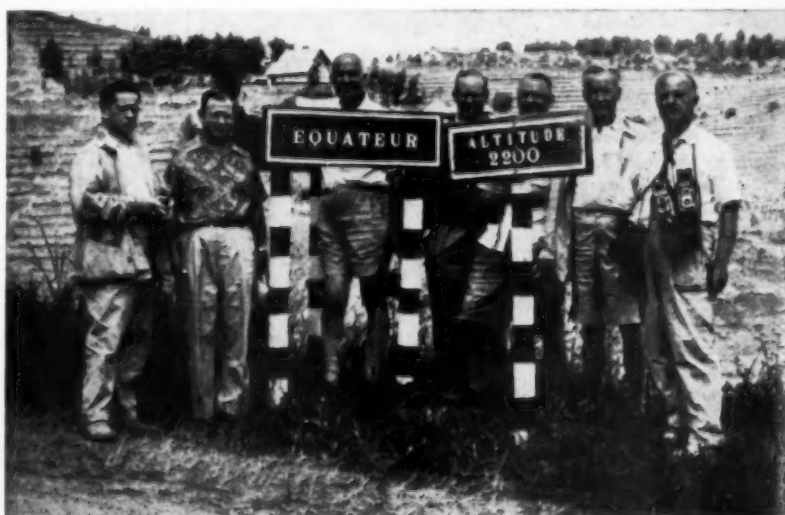
Next morning we took aboard two native guides and made a tour of the one portion of the park accessible by road. In a sense I was disappointed, for I've seen a much greater concentration of wildlife in Kenya and in Uganda north of Lake Victoria. But we did have our fill of lots of hippopotami, scads of 'em, loafing and playing in the river. Hippos are harmless as

long as they're comfortable in the water, but let one catch you between it and the water and you're a dead duck.

There were some elephants, but not too many. We wanted very much to spot a lion but we never saw one anywhere. Those beautiful and fast-running impala antelopes were plentiful. So were topis, another type of antelope with dark horns. There were plenty of warthogs, and a type of monkey, and black buffalo, and various types of big birds, but no rhinoceros. And there are no giraffes in this park, all of these animals being farther east.

We had about 80 miles to go to reach the town of Goma at the north end of Lake Kivu where, we were told, we would be royally entertained. We decided to skip lunch at the less-pleasant Ruindi Camp and headed south over the plain. Soon we were in volcanic country that reminded me very much of El Salvador. There were all sorts of cones, some small, some very large, and some of them quite active. The last volcanic action was in 1948 but I'm sure there will be many more and the whole area lives in knowledge that any day something might cut loose.

Goma was worth waiting for. It's a gem.



The Congo Safari at one of numerous crossings of equator. This one was at 2,200 meters (7,218 feet). Left to right: Max Lerner (N. Y. Post), WWP, a native driver, Frank Bartholomew (United Press), Stan Markusen (Sabena), Bill Yates (Chicago Tribune), Ted Patrick (Holiday Magazine), and Konstantine Kostich, N. Y. photographer.



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